ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Bennington Armory
Indoor Firing Range

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EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
The Bennington indoor firing range has not been fired on since 1992. The range is listed as active, however offices have been put in this area as well as storage items to include lockers	An official decision as to the status of this range should be immediately determined. If the range is to remain active, it must meet requirements set forth in NGR 385-15. If the range is to be converted, it must be adequately cleaned and decontaminated before employee use can resume.	RAC 2
Seven out of eighteen wipe sample results were above the maximum allowable limit of 200 micrograms per square foot. It is unclear what type of protocol janitors cleaning this range used.	If the range is to be converted, it must be cleaned in accordance with National Guard Regulations before employee use can resume.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Bennington Indoor Firing Range Survey performed 17 October 2000 at Bennington Armory, VT.

BACKGROUND:

Introduction. At the request of Ms Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Bennington Indoor Firing Range at the Bennington Armory in Vermont. Ms Non-Responsive Non-Responsive and Mr. Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 17 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Bennington Indoor Firing Range was cleaned in March or April of 2000. The sand and bullet trap were removed at the same time. After cleaning, contractors painted the range, however, it is unknown whether a sealant was used. The range is now used as a supply room and office area. The range has not officially been closed and is still listed as an active range.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. The range was evaluated using the wipe sampling protocol used in the National Guard Pamphlet 385-16, which addresses Indoor Firing Range conversion to other uses. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited. Lead deposits resulting from firing activities can build up in a firing range over time and must be adequately cleaned and sealed before the range is used for other purposes. If the range is not properly cleaned, the potential for exposure to employees who use the converted area remains.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Seven out of the eighteen wipe samples taken inside the range exceeded the limit of 200 micrograms per square foot. It is unknown, what type of protocol was used by janitors cleaning this range and it is apparent that lead contamination still exists. Light fixtures, walls, and beams, as well as a wipe sample taken in the office show high levels of contamination. The range is still listed as active, but has been converted to a supply office and storage area. If the range is to remain active, then all stored and office items must be removed and the range cannot be used for any other purpose than as a firing range. If the range will be officially closed and converted, the indoor firing range should be cleaned so that it is as free of lead dust as possible before the area is used for other purposes to include office space and storage. The protocol found in Appendix C should be used to clean the range and decontaminate items currently stored inside.

Recommendations.

1. Post signs restricting personnel from the range until it has been appropriately cleaned. **(RAC 2)**
2. No stored items should be handled or used until they have been thoroughly decontaminated. **(RAC 2)**
3. No eating, drinking, or use of tobacco products should occur in the area. [29 CFR 1910.1025 (i)(1)] **(RAC 2)**
4. Decide whether the range will be used for range activities (i.e. weapons qualification and firing) or if it would be better suited for storage and office space. The indoor firing range should not be used for both activities. [NGR 385-15, NG PAM 385-16] **(RAC 2)**

    a. If the range is to remain active, the range cannot be used for any purpose other than firing. No equipment or furniture can be stored or maintained in the range. The range must meet all requirements of the National Guard Regulation 385-15 regarding Indoor Firing Ranges. Contact the Regional Industrial Hygiene Office regarding requirements. [NGR 385-15 1-18a, 1-17d] **(RAC 2)**
    b. If the range is to be used as a storage area and office space, it must be thoroughly decontaminated, reevaluated, and approved prior to its use. Follow all described procedures for cleaning and decontamination of the range and all stored items found in Appendix C. **Contact the Regional Industrial Hygiene Office for approval and reevaluation prior to and after cleaning. (RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Rite Aid Towelettes with Benzalkonium Chloride 1:750, 5% Denatured Alcohol
4" X 4" Template

Methodology:

A. *Wipe Samples.* Wipe samples were taken utilizing the protocol as set forth by NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. Details of locations where wipe samples were taken can be found in Appendix D.

Assessment Criteria.

A. Wipe Samples. Wipe sample results were compared with Ventilation rates were compared with the NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. See previous page for Reference information.

B. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

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

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

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

APPENDIX C

Decontamination and Cleaning Protocol

1. Ensure that all procedures listed below comply all federal, state, and local regulations. Consult the Regional Industrial Hygiene Office and State Environmental Office for further guidance.

2. **Ventilation System**
   i. The range ventilation system must be in operation during all cleaning activities. If no ventilation system is available all doors and windows must be kept sealed to prevent contamination of other areas.

3. **Materials**
   i. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup. If a HEPA vacuum cannot be obtained a wet method, detailed below, should be utilized. **A high-pressure water system or dry sweeping may not be used.**
   ii. A cleaning solution containing detergent and water is recommended. New solutions of detergent and water should be mixed frequently.
   iii. Two containers should be used; one for wetting the applicator (rags, sponge, mop) and the other for rinsing once the dust has been wiped from the surfaces.
   iv. Wastewater in containers can be left to evaporate. Any waste left in the buckets and applicators should be disposed of as hazardous waste. Consult the Environmental Office for appropriate disposal instructions.
   v. Personnel responsible for decontamination of the range and stored items should be provided with a full face air purifying respirator with a N100 filter or HEPA filter cartridge providing that all requirements for placing employees in respiratory protection have been met as detailed in 29 CFR 1910.134. Employees should be provided with protective coveralls with hood and shoe covers (i.e. Tyvek™ full body suit). Protective clothing should be hanged daily at the end of the shift and more frequently if the suit becomes grossly contaminated. If cotton coveralls are provided then the employer must provide for maintenance and laundering of protective clothing. Protective clothing should not be taken home and prior to leaving the work area, personnel should thoroughly HEPA vacuum clothing to prevent lead dust from leaving the area. Work and street clothing should not be stored together.

4. **Order of Cleaning**
   i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. All surface areas in the range must be cleaned. Stored items must be decontaminated prior to removal.
   ii. After removing the sand and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plates should be cleaned.
   iii. The ceiling, lights, baffles, retrieval system, heating systems, and ventilation ducts should be cleaned.
   iv. Acoustical material should be vacuumed instead of being painted over, A Toxic Characteristic Leaching Procedure (TCLP) may need to be used for

acoustical material and the like to determine if the material need to be classified as hazardous and disposed of accordingly. The Environmental Office should be contacted regarding this testing.

v. The floor should be the last surface cleaned starting at the bullet trap and ending behind the firing line. Concrete floors should be sealed with deck enamel and linoleum on tile floors should be waxed.

vi. All walls should be painted, preferably with a sealant, that will help prevent leaching of lead after covering.

vii. Following the wet cleaning of the area and after all surfaces have been allowed to dry thoroughly, a HEPA vacuum should be used on all surfaces, until no dust or residue can be seen. A through inspection to detect surface dust should be made following cleanup.

viii. The Regional Industrial Hygiene Office should be contacted for clearance sampling and to approve the range for converted use.

5. **Decontamination of stored items.**

i. All stored items must be decontaminated before removing them from the range. Stored equipment next to the bullet trap and firing line should be decontaminated first.

ii. A HEPA vacuum or wet cleaning method should be used. Every attempt should be made to clean the item before disposing as hazardous waste to reduce cost and waste.

iii. Porous items such as canvas tents or other fabrics may be laundered at companies, which specialize in industrial laundry services. Office partitions and carpeting present during firing should be considered grossly contaminated and disposed of as hazardous waste. Consult the Environmental office before removing and disposing of items.

6. **Medical Surveillance.**

i. A preplacement medical examination is required for all individuals involved with range cleanup operations.

7. **Air Monitoring.**

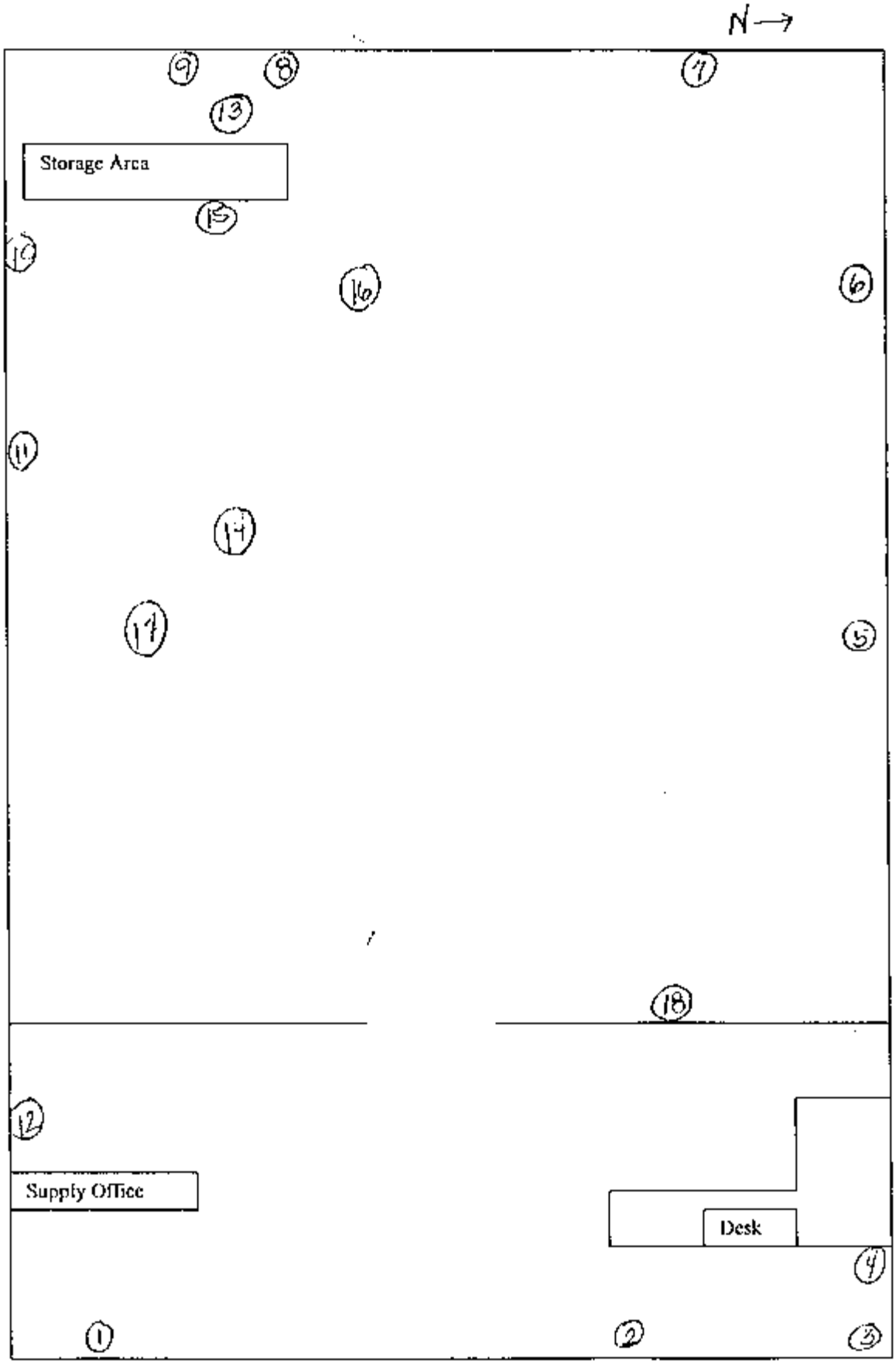
i. Worker breathing zone air samples must be collected during range cleanup to ensure that workers are not overexposed and to evaluate clean up procedures.

8. **Hazard Training**

i. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level of for whom the possibility of skin or eye irritation exists. This training should be provided for all personnel currently involved in rang cleanup operations at least annually.

APPENDIX D

Bennington Indoor Firing Range



Environmental Management Solutions

Bennington Indoor Firing Range

1. Supply Storage Area
2. Office Area
3. Office Area

APPENDIX E

Sample Number	Location	Micrograms/Sample	Micrograms/Square Foot	Within Allowable Limits?
BEN-01	Back Wall 5' (East)	5.0	45.0	Y
BEN-02	Next to Back Wall Door 8'	<3	<27	Y
BEN-03	Back Wall 8"	5.4	48.6	Y
BEN-04	North Side Wall 6'	<3	<27	Y
BEN-05	North Side Wall 7'	<3	<27	Y
BEN-06	North Side Wall 10"	53	477	N
BEN-07	West Front Wall 6'	<3	<27	Y
BEN-08	Wet Front Wall 8'	<3	<27	Y
BEN-09	West Front Wall 8"	<3	<27	Y
BEN-10	South Side Wall 8'	<3	<27	Y
BEN-11	South Side Wall 10"	14	126	Y
BEN-12	South Side Wall 5'2"	25	225	N
BEN-13	East End Floor Under Small Desk (Floor)	100	900	N
BEN-14	Mid/Corner (Floor)	170	1530	N
BEN-15	Front Floor	77	693	N
BEN-16	Overhead Wood Beam (Center)(Ceiling)	48000	432000	N
BEN-17	On Top Light Fixture	52	468	N
BEN-18	On Top of Partition Wall 2X4 Support	11	99	Y
BEN-19	Blank	<3	<27	Y
BEN-20	Blank	<3	<27	Y

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Bennington Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Gosse Court Armory
Indoor Firing Range

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EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
This range has been classified as unsafe due to deficiencies in the building envelope and as limited use based on ventilation measurements and air sampling.	Further use of this range is restricted until deficiencies in the building envelope have been corrected, reinspected, and approved. Range is classified as limited use on lanes 1,2, and 5 after building envelope deficiencies have been corrected and until ventilation deficiencies are corrected, reinspected, and approved.	RAC 2
BUILDING ENVELOPE		
All firing lanes are less than 4 feet wide.	Re-mark firing lanes so that they are no less than 4 feet wide.	RAC 3
Interior mortar joints are not flush with the interior surface of the range.	Make all mortar joints flush with the interior surface.	RAC 2
Access doors are not weather-stripped.	Access doors should be weather-stripped and the locks should be fixed so that the door closes and locks properly.	RAC 2
RANGE LIGHTING		
No emergency lights are provided in the range and exit lighting is burned out.	Emergency exits and lights should be provided behind the firing line.	RAC 3
RANGE USE		
Lockers, tables, chairs, and other items were found stored in the range.	No items should be stored in the firing range at any time. Stored items should be decontaminated and removed.	RAC 2
Stored items were found in front of the plenum wall.	All items s in front of the plenum wall should be decontaminated and removed from the range.	RAC 2
Persons using the range are allowed to walk downrange.	Only range custodians are allowed access downrange. Unauthorized personnel should not be permitted downrange.	RAC 2
A fire extinguisher is not provided in the range.	An ABC type fire extingnisher should be kept at the firing line in case of emergencies.	RAC 3
RANGE MAINTENANCE		
Dry sweeping of the range is permitted and brooms indicating such were found in the area.	Dry sweeping of indoor firing ranges is prohibited and should not be permitted.	RAC 2
POSTING OF SIGNS		
Warning signs were not posted in the range.	Post appropriate signs in the vicinity of the range and on the entrance door.	RAC 2

FINDINGS	RECOMMENDATIONS	RAC
	RANGE SOP	
Gasse Court Armory has no approved standing operation procedure	Develop and implement a standing operation procedure.	RAC 2
	RECORDKEEPING	
No records of range training, maintenance, or cleaning are maintained.	Maintain appropriate records regarding range operations and procedures	RAC 2
	VENTILATION	
Supply and exhaust fans are not interlocked with range lighting.	Interlock supply and exhaust fans with range lighting.	RAC 3
Ventilation flow rates were found below 50 fpm in different positions in the firing lanes.	Holes in the plenum wall should be one inch in diameter and extended over the entire surface of the plenum wall.	RAC 2
Flow rates at the plenum wall were less than the required 400 to 600 fpm		
More than 10 to 15% of the plenum wall is open.		
The plenum wall extends 4/5 of the way across the back wall.	The plenum wall should extend across the entire back wall.	RAC 2
Smoke tests revealed turbulence at the firing line observable in three and four.	Correct ventilation system deficiencies to provide a uniform and even flow rate.	RAC 2
	AIR SAMPLING	
Air sampling results ranged from <0.014 to 0.093 mg/m^3.	Range is classified as limited use based on results of air sampling. Appropriate records must be kept for all persons using the range.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Gosse Court Indoor Firing Range Survey performed 19 October 2000 at Gosse Court Armory, VT.

BACKGROUND:

Introduction. At the request of Ms Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Gosse Court Indoor Firing Range at the Gosse Court Armory in Vermont. Non-Responsive Non-Responsive contract industrial hygienist, Ms Non-Responsive and Mr. Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 19 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Gosse Court Indoor Firing Range is used for weapons firing and qualification. The range is used by local gun clubs approximately two to three nights per week, by the air guard once per week, and by the National Guard one to two times per month. The range has five lanes and a mechanical ventilation system with a plenum that extends 4/5 of the way across the back wall.

Scope of Work. The Indoor Firing Range was visually examined and evaluated to assess potential hazards present. A range inspection checklist found in National Guard Regulation 385-15, which addresses Indoor Firing Range use and maintenance, was completed for the range. Smoke candles were utilized to observe airflow patterns in the range. Ventilation studies and air sampling was performed to quantify performance of the range and its effectiveness in reducing employee exposure to lead dust. Reference information and Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

a. Building Envelope. This indoor firing range measures 50' from the firing line, 70' in total length, 18' wide, and 11' high. The five firing lanes are less than four feet wide and are numbered only at the firing line. Interior mortar joints are not flush with the interior surface and do not create a smooth, even surface downrange. Pipes and conduits are adequately sealed and the walls and ceiling are adequately protected against projectiles. The access door to the range is not adequately weather-stripped.

Recommendations.

1. All firing lanes should be no less than 4 feet wide and marked at both the firing line and bullet trap to prevent accidental cross firing. [CEHND 1110-1-18, 2-1 (C) 2] **(RAC 3)**
2. All interior mortar joints should be flush with the interior surface of the range. [CEHND 111-1-18, 3-1d(3)] **(RAC 2)**
3. Weather-strip all access doors to the range to prevent leakage of lead dust and debris into outlying areas. [385-15 2-2a(2)(b)] **(RAC 2)**
4. **The range is classified as unsafe due to deficiencies found concerning the building envelope. All deficiencies should be corrected before firing may resume.**

b. Range Lighting. Range lighting is relatively uniform and does not cause shadows. Lighting measures an average 111 FC at the targets and 44 FC in all other areas. All lighting is adequately protected by baffles. No emergency lights are provided for the range and exit lighting is burned out. Access behind the bullet trap could not be obtained during the survey and it is unknown whether the appropriate lighting is provided in this area.

Recommendations.

1. Emergency and exit lights should be provided behind the firing line to adequately protect personnel from shooting accidents and to guide them out of the range in the case of an emergency or power outage. [CEHND 110-1-18, 3-4c(c)] **(RAC 3)**

c. ***Bullet Traps.*** An inclined plate bullet trap is permanently installed and is designed for .22 caliber use, which is all that is permitted for firing on this range. The bullet trap measures ¼ " thick and adequately prevents ricochets. The bullet trap is in good shape and is smooth without any seams or overlapping. Access behind the bullet trap could not be obtained.

Recommendations.

1. The bullet trap should be adequately maintained. Rust or paint chips may cause ricochets. A thin coating of oil should be applied every 3 months for moderate firing, sooner if heavy firing occurs (10W30 or 3 in 1). **DO NOT APPLY GREASE. (RAC 3)**
2. Bullet collection bins should not be allowed to get over ¾ full. Contact the VT ARNG State Environmental Office prior to emptying for disposal instructions. **(RAC 3)**

d. ***Targets and Target Carriers.*** Target retrieval systems were provided for each lane and are in good working order. Paper targets are used for personnel during firing procedures.

Recommendations.

1. There are no recommendations for targets or target retrieval systems at this time.

e. ***Range Use.*** Firing in the firing range occurs two to three nights per week by local gun clubs. The air guard fires approximately once per week. National Guard use occurs one to two times per month. Lockers, tables, chairs, and other items are stored in the range. Additional clothing and equipment is brought in for storage. Items were stored in front of the plenum wall. Personnel site the reason for storing items in the ranges are lack of space in the facility. Persons using the range are reportedly allowed to walk downrange. An appropriate fire extinguisher is not provided in the range.

Recommendations.

1. No items should be stored in the firing range at any time. Stored items can become contaminated with lead dust and will increase the exposure to anyone who moves or touches them. [NGR 385-15 2-3a, 2-4h] **(RAC 2)**
2. No items should be stored in front of the plenum wall, which will disturb air flow while the ventilation system is running. [NGR 385-15 2-4a] **(RAC 2)**

3. Only range custodians are allowed access downrange. Unauthorized personnel should not be permitted downrange in order to minimize their exposure to lead dust. [NGB 385-15 2-4f] **(RAC 2)**
4. Eating, drinking, and use of tobacco products without washing hands and face prior to these activities can lead to ingestion of lead dust that have settled on hands, surfaces, or food and drink. Oral ingestion may represent a major route of exposure in contaminated workplaces. All personnel should be strictly prohibited from consuming food and beverages in the area, using tobacco products, or applying cosmetics (i.e. lip balm). [29 CFR 1910.1025 (i)(1)]. **(RAC 2)**
5. A hand held ABC-type fire extinguisher should be kept at the firing line in case of emergencies. [DGi 415-1, App. A, 4-5] **(RAC 3)**

f. ***Range Maintenance.*** Dry sweeping of the range was reported and brooms were found in the area to indicate any dry sweeping of the area.

Recommendations.

1. The indoor firing range should be cleaned with the ventilation system operating to prevent dust and debris from entering the worker's breathing zone. Floor areas from behind the firers to the firing line and 15 feet downrange should be cleaned at the end of each firing day. [NIOSH 76-130, p.24, II, 1, NGR 385-15 1-32f] **(RAC 2)**
2. Dry sweeping and cleaning bullet traps by pouring or shoveling bullet debris into waste buckets causes settled lead dust to become airborne and possibly inhaled. **Dry sweeping of indoor firing ranges is prohibited.** A High Efficiency Particulate Air (HEPA) filtered vacuum system is the recommended choice for range cleanup of lead dust and particles only (no bullet casings). If a HEPA vacuum cannot be acquired a wet method should be used, which includes a solution of detergent and water. Two containers should be used; one to wet the area, and the other to rinse the applicator after the dust has been wiped from the surface. Water should be changed often to prevent reapplication of contaminated water. Wastewater should be left to evaporate and the residue and any applicators should be disposed under guidance from the VT ARNG Environmental Office. [29 CFR 1910.1025(h)(ii), NIOSH 76-130, P.24, II, 2] **(RAC 2)**

3. One person, preferably the range custodian, should be responsible for cleaning the range and discarding debris. The range should be cleaned **ONLY** with a HEPA vacuum system or utilizing a wet method. [29 CFR 1910.1025(h)(ii)] **(RAC 2)**

g. ***Personal Protective Equipment (PPE).*** Personnel were observed wearing appropriate hearing and eye protection.

Recommendations.

1. There are no recommendations for personal protective equipment at this time.

h. Posting of Signs. No warning signs are posted in the area. An illuminated warning sign to alert personnel while range is in use and is visible at the outside door. The illuminated sign is interlocked with range lighting. An acknowledgement book is provided covering the Standing Operation Procedures (SOP) items. No warning signs are posted outside of the access door to the bullet trap, warning personnel not to enter during range operation.

Recommendations.

1. The following signs should be posited in or in the vicinity of the range and of the access door to the bullet trap. [NGR 385-15 3-6a,b] **(RAC 2)**:

a. Eating, drinking, and Smoking are Prohibited
b. Dry Sweeping is Prohibited
c. Wash Hands and Face Immediately Following Firing
d. The Following Ammunition is Authorized for use on this Range
e. Hearing Protection Must Be Properly Worn During Firing
f. Proper Safety Glasses/Goggles Must Be Worn During Firing
g. No Furniture or Storage of Items Permitted in the Range

2. The Following Signs must be posted on the entrance door to the range and to the access door of the bullet trap:

a. Noise Hazardous Area
b. Danger Lead Hazard Area
c. Pregnant Females are Not Permitted in this Area

2. An illuminated sign should be interlocked with the range ventilation switch and located outside of the firing range to alert individuals outside when the range is in use. [NGR 385-15 2-6c] **(RAC 4)**

i. Range Standing Operation Procedure (SOP). A Range SOP, with all requirements, is not available for this facility as approved by the State Safety Office. A visitor's log, instructive guidance, and personal protective requirements are addressed during briefings of representatives of groups using the firing range.

Recommendations.

1. A Range Standing Operation Procedure should be written for this facility which includes the following **(RAC 2)**:

i. Requirements for establishment and maintenance of a visitor's log indicating date, age, and ammunition fired
ii. Requirements for safety briefing for all individuals before entrance to the range given by a designated range safety officer
iii. Work practices
iv. Instructive guidance
v. Personnel responsibilities for performing, supervising, reviewing, and updating the SOP
vi. Authorized ammunition
vii. Posting of signs
viii. Cleaning and maintenance requirements
ix. PPE requirements for maintenance, firing, and cleaning of the range.

i. **Recordkeeping.** Records kept by range custodian are a visitor's log with name and age of firer, organization and sign in and sign out times. The type of ammunition used is not documented. Range custodian was not available to provide copies of initial and previous inspection information and any air-sampling data. No OSHA compliance program is in place. Range custodian has not been trained on lead hazards specific to firing and cleaning of the range.

Recommendations.

1. A visitor's log must be maintained that contains the name and age of firer, organization, sign in and out time, type of ammunition, and number of rounds fired. [NGR 385-15 1-16e] **(RAC 2)**
2. A copy of this and any other inspections should be maintained. [NGR 385-15 3-6] **(RAC 2)**
3. An OSHA compliance program must be established and maintained. The written plan should include a description of the operation, ammunition and weapons used, existing controls, groups using the firing range, employee job responsibilities, operating procedures and maintenance practices. A record of previous inspections and air sampling data must also be retained. [29 CFR 1910.1025(e)(3)(i-ii)]. **(RAC 2)**
4. All individuals utilizing the range must be provided with a copy of the SOP or have been briefed on the units' requirements and must sign an agreement to follow the rules. [NGR 385-15 1-15h] **(RAC 2)**
5. State maintenance officers and custodians must be fully trained on an annual basis on the health effects from exposure to lead dust and the appropriate precautions that must be taken. Records verifying this training must be kept by the range custodian. Each employee who works in a place in which there is a potential exposure to airborne lead at any level shall inform employees of the Content of Appendix A Substance Data Sheet for Occupational Exposure to Lead, and Appendix B Employee Standard Summary of OSHA regulation

1910.1025. Initial training should be performed at least 180 days from date of initial job assignment and annually thereafter. [29 CFR 1910.1025(l)(1)(I-iv), 29 CFR 1910.1200(h)] **(RAC 2)**

6. A range safety officer and custodian should be designated in writing. [NGR 385-15 1-17d] **(RAC 2)**

j. **Ventilation.** The range is equipped with an operational ventilation system, with 100% of the make-up air exhausted at the bullet trap. Supply and exhaust fans are not interlocked with range lighting. Ventilation Flow rates were found below 50 fpm in the standing positions in lanes 1, 3, and 4 and in the kneeling position in lane 4. (See diagram in Appendix D for detailed measurements). Flow rates measured greater than 75 fpm.

The plenum wall extends approximately 4/5 of the way across the back wall and flow rates at the plenum wall did not have the required 400 to 600 fpm. More than 10-15% of the plenum wall is open. Smoke tests revealed turbulence at the firing line, observable in lanes three and four. Smoke originating at the firing line curled back behind the firing line instead of moving downrange. This indicates that during firing, lead dust would blow back into the firer's face.

Recommendations.

1. Interlock supply and exhaust fans with range lighting so that the ventilation system operates at all times during occupancy of the range. [CEHND 110-1-18, 3-4a] **(RAC 3)**
2. Results of ventilation and smoke tests indicate that adequate flow rates are being provided by the fan but are not evenly and uniformly distributed to move lead dust downrange and away from firer's breathing zone. The purpose of the plenum wall is to provide enough resistance to straighten the airflow and allow it to be distributed evenly and uniformly downrange. The plenum wall should be retrofitted so that it extends the entire length of the back wall. The holes should be made one inch in diameter and evenly distributed across the surface of the plenum wall and centered in a four-inch square area. The airflow must measure at least 50 fpm at all positions in the firing lane. **(RAC 2)**

k. **Air Sampling.** Air sampling was conducted to simulate weapons qualifications. Sampling was conducted on three personnel in lanes 1, 2, and 5, and in the supply office, where supply personnel have complained of smelling fumes. Lanes in 3 and 4 were not sampled due to turbulence noted during smoke tests. Air sampling results for lead ranged from <0.014 to 0.093 mg/m^3. According to National Guard regulations, Guardsmen exposed to lead at these levels in the range less than thirty days per year are permitted to use the range up to four hours per day. Guardsmen utilizing the range for over thirty days per year and all non-military personnel are limited to 2.25 hours

per day at these lead levels. Range users under 17 are limited to one hour per day. Air sampling results for copper and barium were well below allowable ACGIH, NIOSH, and OSHA limits.

Recommendations.

1. This range is classified as limited use based on sampling results collected during the survey. Only lanes 1, 2, and 5 are available for use. **(RAC 2)**
2. A record must be maintained for time spent on the range for all personnel using limited use firing ranges as recorded by the range custodian.[NGR 385-15 1-15 b] **(RAC 2)**
3. Air Sampling should again be conducted after changes required in the ventilation system have been made. [NGR 385-15 1-27 c] **(RAC 2)**

Range Status. This range has been classified as unsafe due to deficiencies in the building envelope. After these deficiencies have been corrected, the range can be classified as limited use based on the ventilation system measurements and air sample results.

Recommendations.

1. Further use of this range is restricted until deficiencies in the building envelope have been corrected, reinspected, and approved. The range is then classified as limited use until ventilation deficiencies are corrected, reinspected, and approved. [NGR 385-15 1-17; a,2 a and f; b 2 a; and f 2 a and b] **(RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH), Industrial Ventilation, A Manual of Recommended Practice, 23rd Edition, 1998.

American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices for 2000.

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Safety Council, Fundamentals of Industrial Hygiene, 4th edition, 1996.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

National Institute for Occupational Safety and Health, Pocket Guide to Chemical Exposures, 2000.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Ametek Air Sampling Pumps, M/N P4LC
BIOS DryCal DC-1 Flow Calibrator.
TSI Air Velocity Meter, M/N VelociCalc 8360
Light Meter

Methodology.

A. *Ventilation.* Ventilation measurements were taken by taking readings at the standing, kneeling, and prone positions at the firing line. Details of locations where ventilation measurements were made can be found in Appendix D.

Assessment Criteria.

A. Ventilation Standards. Ventilation rates were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information.

B. Exposure Standards. Air sampling results for lead were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information. Air sampling results for copper and barium were compared to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Levels (PELs), the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Levels (RELs). See previous page for reference information.

C. Illumination Standards. Illumination measurements were taken in all areas. Measurements were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information.

D. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

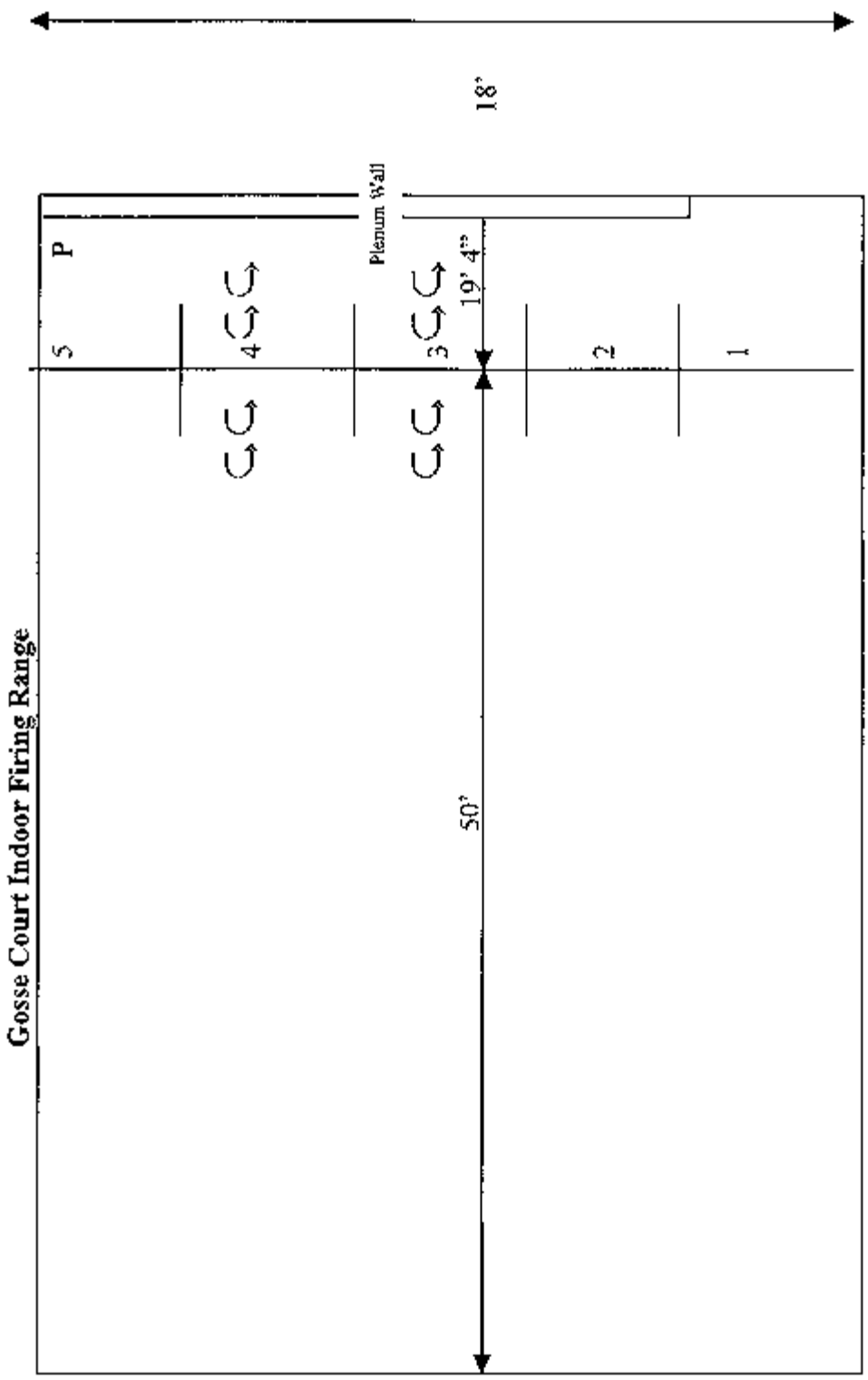
C. Determine the MPC for health hazards by totaling the points assessed and using the following guide:

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

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

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

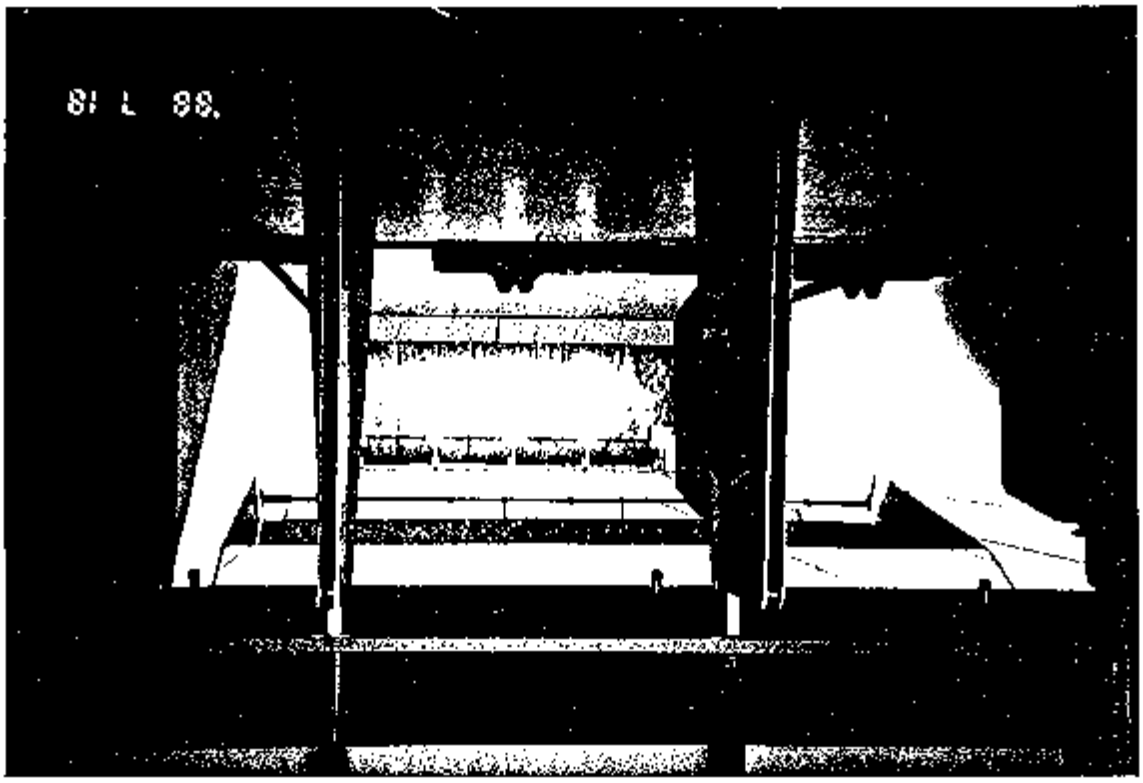
APPENDIX C



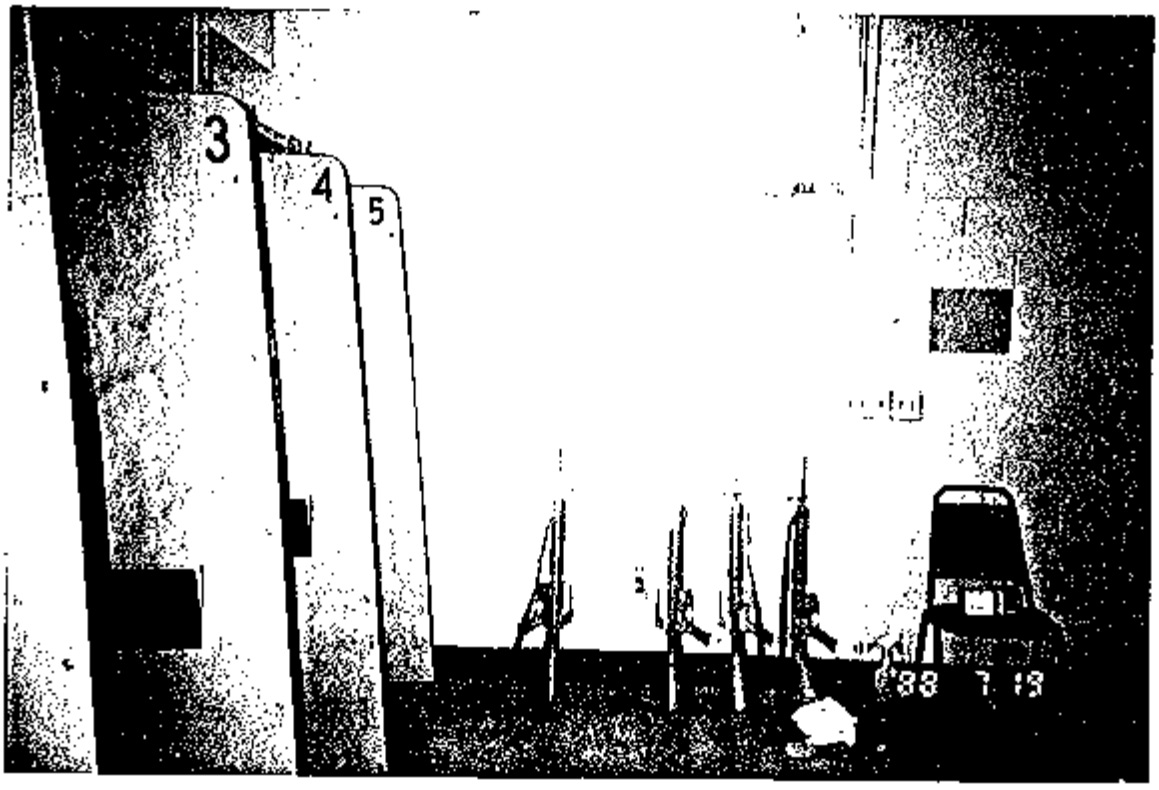
Environmental Management Solutions

[illegible] Denotes turbulence

Gosse Court Indoor Firing Range



Results of Smoke Tests Show Turbulence in Lanes Three and Four.



Warning Signs and
Illuminated "In Use" Sign
Posted at the Range Entrance

Range Rules
and Sign In Sheet

Plenum Wall Extends 4/5 of the way across the back wall. More than 10 to 15% open of the wall is open which may be responsible for the turbulence observed..

APPENDIX D

Ventilation Measurements
Indoor Firing Range Lanes

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5
Standing	40	104	19	45	113
Kneeling	97	114	55	40	101
Prone	135	115	109	65	114

APPENDIX E

Air Sampling Results
Indoor Firing Range

LEAD				
Sample Number	Results mg/m^3	Maximum Hours of Allowable Exposure Per Day Guardsmen exposed less than 30 days per year	Maximum Hours of Allowable Exposure Per Day Guardsmen exposed more than 30 days per year	Maximum Hours of Allowable Exposure Per Day Range Users Under 17 Year s of Age
GC-01	0.093	4	2.25	1
GC-02	0.035			
GC-03	0.022			
GC-04	<0.037			
GC-05	<0.014			
GC-06	0.019			
GC-BL1	NA	NA	NA	NA
GC-BL2	NA	NA	NA	NA

	Copper			Barium		
Sample Number	Results mg/m^3	Time Weighted Average (TWA)	Within allowable Limits?	Results mg/m^3	Time Weighted Average (TWA)	Within Allowable Limits?
GC-01	0.0036	0.00027	Y	<0.028	0.0021	Y
GC-02	<0.0019	0.00014	Y	<0.029	0.0021	Y
GC-03	<0.0020	0.00016	Y	<0.029	0.0020	Y
GC-04	<0.0037	0.00028	Y	<0.056	0.0042	Y
GC-05	0.013	0.0013	Y	<0.021	0.0021	Y
GC-06	0.0028	0.00029	Y	<0.020	0.0021	Y
GC-BL1	NA	NA	NA	NA	NA	NA
GC-BL2	NA	NA	NA	NA	NA	NA

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

11160015031709

Date 11/16/00
Laboratory Group Name 00I-2206-01
Account No. 07003

Environmental Management Solutions
Attention: Non-Responsive
P.O. Box 6893
Douglasville, GA 30154

FAX (770) 234-6297
Telephone (678) 596-8509

Sampling Collection and Shipment

Sampling Site Gosse Court Armory Date of Collection October 19, 2000

Date Samples Received at Laboratory November 01, 2000

Analysis

Method of Analysis NMAM 7300

Date(s) of Analysis November 15, 2000

Analytical Results

Field Sample Number	Laboratory Number	Sample Type	Lead µg/sample	Copper µg/sample	Barium µg/sample	Lead mg/m³	Copper mg/m³	Barium mg/m³	Air Volume L		
GC-01	00I16038	MCE	10.	0.39	ND	0.093	0.0036	<0.028	108.		
GC-02	00I16039	MCE	3.7	ND	ND	0.035	<0.0019	<0.029	105.		
GC-03	00I16040	MCE	2.2	ND	ND	0.022	<0.0020	<0.029	102.		
GC-04	00I16041	MCE	ND	ND	ND	<0.037	<0.0037	<0.056	54.		
GC-05	00I16042	MCE	ND	1.8	ND	<0.014	0.013	<0.021	141.		
GC-06	00I16043	MCE	2.8	0.42	ND	0.019	0.0028	<0.020	150.		
GC-BL1	00I16044	MCE	ND	ND	ND	**	**	**	**		
GC-BL2	00I16045	MCE	ND	ND	ND	**	**	**	**		
Reporting Limit			2.	0.2	3.						

* See comment on last page.
ND Parameter not detected above LOD.
NR Parameter not requested.

** See comment on last page.

Non-Responsive

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

11160015031709

Date 11/16/00

Laboratory Group Name 00I-2206-01

General Set Comments

Results cannot be reported in mg/m' or ppm for samples with no air volume.

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
FAX (801) 268-9992

ANALYTICAL REQUEST FORM

DATA CHEM LABORATORIES

1. ☒ REGULAR Status 22010-01

☐ RUSH Status Requested - ADDITIONAL CHARGE

RESULTS REQUIRED BY _____ DATE

CONTACT DATACHEM LABS PRIOR TO SENDING SAMPLES

2. Date 27 04 00 Purchase Order No. _____

3. Company Name NATIONAL GUARD BUREAU
Address ATTN: NGB-AVN-SI
301-IH Old Bay Lane
Person to Contac Havre de Grace, MD 21078-4094
Telephone (phone: (410) 942-0273
Fax Telephone (fax (410) 942-0254
Non-Responsive
Industrial Hygienist

4. Quote No. 102700 - RP (>95%)
DCL Project Manager _____

5. Sample Collection
Sampling Site [illegible]
Industrial Process [illegible]
Date of Collection [illegible]
Time Collected _____
Date of Shipment _____
Chain of Custody No. _____
Collector's Name / Signatur Non-Responsive
Non-Responsive

6. REQUEST FOR ANALYSES

Laboratory Use Only	Client Sample Number	Media Type*	Sample Volume (Liters)	ANALYSES REQUESTED - Use Method Number if Known
[illegible]	GR-01	MCE	108 L	Lead, Copper, Barium (NIOSH 7303)
[illegible]	GR-02	CE	105 L	
[illegible]	GR-03	CE	102 L	
[illegible]	GR-04	CE	54 L	
[illegible]	GR-05	CE	141 L	
[illegible]	GR-06	CE	150 L	
[illegible]	GR BL1	CE	blank	
[illegible]	GR BL2	CE	blank	
		SKC		
		P/N 225-501		
		Lot [illegible]		

*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)
☐ OTHER (as specified below)

Comments Air samples collected during firing of .22 jacketed ammo in an indoor firing range.

Possible Contamination and/or Chemical Hazards

7. 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

INDUSTRIAL HYGIENE
SAMPLING RESULT NOTIFICATION SHEET

DATA REQUIRED BY THE PRIVACY ACT

AUTHORITY: Sections 133, 1071 87, 3012, 5031, and 8012, title 10, United States Code, Executive Order 9397 and AR 40 6.

PRINCIPAL PURPOSE: The Social Security Number of the individual is required to identify, record, and retrieve occupational medical surveillance records.

ROUTINE USE: The primary use of this information is to provide, plan, and coordinate occupational health medical surveillance and care.

DISCLOSURE: In the case of military personnel and Federal employees, the requested information is mandatory because of the need to document all occupational injuries and illnesses in view of future rights and benefits. If the requested information is not furnished comprehensive medical surveillance may not be possible, but AUTHORIZED CARE WILL NOT BE DENIED.

NAME:	SOCIAL SECURITY NO.:	OPERATION:	BLDG:	DIRECTORATE/COLLOCATED ACT
Non-Responsive	Non-Responsive	Weapons Firing	Gosse	Court Indoor Firing Ran

Air sampling took place on 19 October 2000 to determine workplace exposure to:

SUBSTANCE	PERMISSIBLE EXPOSURE LIMIT	YOUR RESULTS	EXP CATEGOR (See Below)
1. Lead	0.050 mg/m3 (OSHA)	0.007 mg/m3	1
2. Copper	1 mg/m3 (OSHA)	0.00027 mg/m3	1
3. Barium	0.5 mg/m3 (OSHA)	<0.0021 mg/m3	1
4.			
5.			
6.			

EXPOSURE CATEGORY

1. Airborne levels are below permissible limits; no work changes necessary.
2. Airborne levels are close to permissible limits; additional sampling necessary; temporary use of respiratory protection during this operation
3. Airborne levels are above permissible limits and the following actions are indicated (where feasible) to prevent overexposure:
   a. Ventilation system improvements required (general and/or local exhaust).
   b. Engineering controls required.
   c. Employee work practices need improvement.
   d. Improve housekeeping.
   e. Personal protective equipment mandatory until exposure is below permissible limits.

COMMENTS:

SIGNATURE: Non-Responsive DATE:

INDUSTRIAL HYGIENE
SAMPLING RESULT NOTIFICATION SHEET

DATA REQUIRED BY THE PRIVACY ACT

AUTHORITY: Sections 133, 1071 87, 3012, 5031, and 8012, title 10, United States Code, Executive Order 9397 and AR 40 5.

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NAME:	SOCIAL SECURITY NO.:	OPERATION:	BLDG:	DIRECTORATE/COLLOCATED ACT
Non-Responsive	Non-Responsive	Weapons Firing	Gosse Court	Indoor Firing Ran

Air sampling took place on 19 October 2000 to determine workplace exposure to:

SUBSTANCE	PERMISSIBLE EXPOSURE LIMIT	YOUR RESULTS	EXP CATEGORY (See Below)
1. Lead	0.050 mg/m3 (OSHA)	0.003 mg/m3	1
2. Copper	1 mg/m3 (OSHA)	0.00014 mg/m3	1
3. Barium	0.5 mg/m3 (OSHA)	<0.0021 mg/m3	1
4.			
5.			
6.			

EXPOSURE CATEGORY

1. Airborne levels are below permissible limits; no work changes necessary.
2. Airborne levels are close to permissible limits; additional sampling necessary; temporary use of respiratory protection during this operation.
3. Airborne levels are above permissible limits and the following actions are indicated (where feasible) to prevent overexposure:
   a. Ventilation system improvements required (general and/or local exhaust).
   b. Engineering controls required.
   c. Employee work practices need improvement.
   d. Improve housekeeping.
   e. Personal protective equipment mandatory until exposure is below permissible limits.

COMMENTS:

SIGNATURE: Non-Responsive

INDUSTRIAL HYGIENE
SAMPLING RESULT NOTIFICATION SHEET

DATA REQUIRED BY THE PRIVACY ACT

AUTHORITY: Sections 133, 1071 87, 3012, 5031, and 8012, title 10, United States Code, Executive Order 9397 and AR 40 5.

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ROUTINE USE: The primary use of this information is to provide, plan, and coordinate occupational health medical surveillance and care.

DISCLOSURE: In the case of military personnel and Federal employees, the requested information is mandatory because of the need to document all occupational injuries and illnesses in view of future rights and benefits. If the requested information is not furnished comprehensive medical surveillance may not be possible, but AUTHORIZED CARE WILL NOT BE DENIED.

NAME:	SOCIAL SECURITY NO.:	OPERATION:	BLDG:	DIRECTORATE/COLLOCATED ACT
Non-Responsive [redacted]	Non-Responsive [redacted]	Weapons Firing	Gosse Court Indoor Firing Ran	

Air sampling took place on 19 October 2000 to determine workplace exposure to:

	SUBSTANCE	PERMISSIBLE EXPOSURE LIMIT	YOUR RESULTS	EXP CATEGORY (See Below)
1.	Lead	0.050 mg/m3 (OSHA)	0.002 mg/m3	1
2.	Copper	1 mg/m3 (OSHA)	0.00016 mg/m3	1
3.	Barium	0.5 mg/m3 (OSHA)	<0.0020 mg/m3	1
4.				
5.				
6.				

EXPOSURE CATEGORY

1. Airborne levels are below permissible limits; no work changes necessary.
2. Airborne levels are close to permissible limits; additional sampling necessary; temporary use of respiratory protection during this operation.
3. Airborne levels are above permissible limits and the following actions are indicated (where feasible) to prevent overexposure:
   - a. Ventilation system improvements required (general and/or local exhaust).
   - b. Engineering controls required.
   - c. Employee work practices need improvement.
   - d. Improve housekeeping.
   - e. Personal protective equipment mandatory until exposure is below permissible limits.

COMMENTS:

SIGNATURE Non-Responsive [redacted] May

ORGANIZATION

DATE

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Goss Court Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms. Aisha-Zakiya Boyd.

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Campbell Armory
Indoor Firing Range

PO BOX 6891, DOUGLASVILLE, GEORGIA 30154
PHONE 678.596.8609 • FAX 770.234.6297

Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
This range has been classified as unsafe due to deficiencies in the building envelope, target retrieval system, and ventilation system	Further use of this range is restricted until deficiencies have been corrected, reinspected, and approved	RAC 2
	BUILDING ENVELOPE	
Access doors are not weather-stripped and must be propped closed.	Access doors should be weather-stripped and the locks should be fixed so that the door closes and locks properly.	RAC 2
A roll up door is installed at the firing line	No access doors or windows should be forward of the firing line.	RAC 2
	RANGE LIGHTING	
Lighting causes shadows and glare	Consult the FMO to resolve shadows and glare caused by lighting.	RAC 4
No emergency or exit lights are provided in the range	Emergency and exit lights should be provided behind the firing line.	RAC 3
	BULLET TRAPS	
Bullet traps were found full.	Bullet collection bins should not be allowed to get over ¼ full. Contact the VT ARNG State Environmental Office prior to emptying for disposal instructions.	RAC 3
	TARGET AND TARGET CARRIERS	
There is no target retrieval system installed.	A target retrieval system should be installed.	RAC 2
	RANGE USE	
Furniture, lockers, storage cabinets and other items were found stored in the range.	No items should be stored in the firing range at any time. Stored should be decontaminated and removed.	RAC 2
	RANGE MAINTENANCE	
No target retrieval system is provided in the range.	A target retrieval system should be installed to prevent personnel from having to walk down range to retrieve targets and disturb lead dust that has settled in the area.	RAC 2
The range has not been cleaned since 1998.	The range should be cleaned at least every three months or after firing if the range is not used as often.	RAC 2
	PERSONAL PROTECTIVE EQUIPMENT	
Personnel did not have adequate eye protection.	All personnel should wear ANSI approved eye protection. Have additional eye protection and hearing protection available for those that do not have their own.	RAC 2
	POSTING OF SIGNS	

FINDINGS	RECOMMENDATIONS	RAC
Signs were not posted in the range.	Post appropriate signs in the vicinity of the range and on the entrance door.	RAC 2
	RANGE SOP	
Campbell Armory has no approved standing operation procedure	Develop and implement a standing operation procedure	RAC 2
	RECORDKEEPING	
No records of range training, maintenance, or cleaning are maintained.	Maintain appropriate records regarding range operations and procedures	RAC 2
	VENTILATION	
Ventilation system is inadequate. Results of smoke test reveal stagnant air	Contact the FMO to replace the current ventilation system so that it meets NGR 385-15 specifications.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Campbell Indoor Firing Range Survey performed 18 October 2000 at Campbell Armory, VT.

BACKGROUND:

Introduction. At the request of Ms. Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Campbell Indoor Firing Range at the Campbell Armory in Vermont. Non-Responsive Non-Responsive contract industrial hygienist, Ms. Non-Responsive and Mr. Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 18 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Campbell Indoor Firing Range was constructed in the 1950s and is used for weapons firing and qualification. The range is used approximately three to four times per month mainly on Tuesday evenings and weekends by the JROTC, and the local high school rifle teams. Military use is limited to approximately once per month. There is no plenum provided for make up air and two exhaust fans in the side wall carry out exhaust.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. A range inspection checklist found in National Guard Regulation 385-15, which addresses Indoor Firing Range use and maintenance, was completed for the range. Smoke candles were utilized to observe airflow patterns in the range. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. This particular indoor firing range is of particular concern due to its use by adolescent firers. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

a. Building Envelope. This indoor firing range measures 50' from the firing line, 22'6" wide and 11' high. Firing lanes are not marked or numbered. No protruding surfaces are installed to cause bullet ricochets, and walls and ceiling are adequately protected against projectiles. A roll-up door is present in the area, which may allow lead dust or debris to escape from the range to the outdoors. The access door to the range is not weather-stripped and must be propped closed with a wooden doorstop.

Recommendations.

1. All firing lanes should be no less than 4 feet wide and marked at both the firing line and bullet trap. [CEHND 1110-1-18, 2-1 (C) 2] **(RAC 3)**
2. Weather-strip all access doors to the range to prevent leakage of lead dust and debris into outlying areas. [385-15 2-2a(2)(b)] **(RAC 2)**
3. No access doors or windows should be forward of the firing line in order to prevent leakage of contaminated air and dust into other areas. [NGR 385-15 2-2a(2)(E)] **(RAC 2)**
4. Fix and weather-strip the access door so that it closes and locks properly during range operations and provides adequate security for the range when not in use. [CEHND 1110-1-18, 3-1e] [DG 415-1, App. A, 3-1h] **(RAC 2)**
5. **The range is classified as unsafe due to deficiencies found concerning the building envelope. All deficiencies should be corrected before firing may resume.**

b. Range Lighting. Range lighting leaves shadows and may cause glare at the firing line but is otherwise adequate, measuring 110 FC at the bullet trap and 40-50 FC in other areas. All lighting is adequately protected and is appropriately placed throughout the range. No emergency lights or exit lights are provided for the range.

Recommendations.

1. Consult the FMO to resolve shadows and glare caused by lighting. **(RAC 4)**
2. Emergency and exit lights should be provided behind the firing line to adequately protect personnel from shooting accidents and to guide them out of the range in the case of an emergency or power outage. [CEHND 110-1-18, 3-4c(c)] **(RAC 3)**

c. ***Bullet Traps.*** An escalator type bullet trap is permanently installed and is designed for .22 caliber use, which is all that is permitted for firing on this range. The bullet trap measures ¼ " thick and adequately prevents ricochets. The bullet trap is in good shape and is smooth without any seams or overlapping. There is no access behind the bullet trap. Bullet debris was found in the catch tray.

Recommendations.

1. The bullet trap should be adequately maintained. Rust or paint chips may cause ricochets. A thin coating of oil should be applied every 3 months for moderate firing, sooner if heavy firing occurs (10W30 or 3 in 1). **DO NOT APPLY GREASE. (RAC 3)**
2. Bullet collection bins should not be allowed to get over ¾ full. Contact the VT ARNG State Environmental Office prior to emptying for disposal instructions. **(RAC 3)**

d. ***Targets and Target Carriers.*** No target retrieval system is available. Paper targets are used for personnel during firing procedures. After firing, weapons are cleared and all firers walk down the range together to retrieve targets.

Recommendations.

1. A target retrieval system should be installed to prevent firers from walking downrange to retrieve targets, further contaminating themselves and other areas of the range. [385-15 2-2e (1)(a)] **(RAC 2)**
2. **The range is classified as unsafe due to deficiencies found concerning the target retrieval system. All deficiencies should be corrected before firing may resume.**

e. ***Range Use.*** Firing in the firing range occurs three to four times per month, mainly on Tuesday evenings and on weekends. The Junior ROTC, and rifle teams from the local high school utilize the range, typically, from September through March. Military use occurs approximately once per month. The firing range is used very infrequently for firing and personnel utilize the space for storage. Chairs, tables, a blackboard, bicycles, lockers, tables, cases, and paints were found stored in the range. Some of these items were found forward of the firing line. Personnel reportedly remove all stored items before firing operations commence. Beverage containers were also found. Tents have been laid out on the firing range floor to let dry before packing them up. No maintenance or cleaning of the range is performed before storage of items. Personnel site the reason for storing items in the ranges are lack of space in the facility. An appropriate fire extinguisher is provided in the range.

Recommendations.

1. No items should be stored in the firing range at any time. Stored items can become contaminated with lead dust and will increase the exposure to anyone who moves or touches them. [NGR 385-15 2-3a, 2-4h] **(RAC 2)**
2. Eating, drinking, and use of tobacco products without washing hands and face prior to these activities can lead to ingestion of lead dust that have settled on hands, surfaces, or food and drink. Oral ingestion may represent a major route of exposure in contaminated workplaces. All personnel should be strictly prohibited from consuming food and beverages in the area, using tobacco products, or applying cosmetics (i.e. lip balm). [29 CFR 1910.1025 (i)(1)]. **(RAC 2)**

f. ***Range Maintenance.*** No dry sweeping of the range was reported and no brooms were found in the area to indicate any dry sweeping. The range has been cleaned once since 1998. After firing, weapons are cleared and all firers walk down the range together to retrieve targets.

Recommendations.

1. A target retrieval system should be installed to prevent personnel from having to walk down range to retrieve targets and disturb lead dust that has settled in the area, further contaminating clothes and skin and adding to employee exposure to lead dust. All personnel should be prohibited from walking downrange. [NGR 385-15 2-4f] **(RAC 2)**
2. The indoor firing range should be cleaned with the ventilation system operating to prevent dust and debris from entering the worker's breathing zone. Floor areas from behind the firers to the firing line and 15 feet downrange should be cleaned at the end of each firing day. [NIOSH 76-130, p.24, II, 1; NGR 385-15 1-32f]] **(RAC 2)**
3. Dry sweeping and bullet traps cleaned by pouring or shoveling bullet debris into waste buckets causes settled lead dust to become airborne and possible inhaled. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the recommended choice for range cleanup of lead dust and particles only (no bullet casings). If a HEPA vacuum cannot be acquired a wet method should be used which includes a solution of detergent and water. Two containers should be used; one to wet the area, and the other to rinse the applicator after the dust has been wiped from the surface. Water should be changed often to prevent reapplication of contaminated water. Wastewater should be left to evaporate and the residue and any applicators should be disposed under guidance from the VT ARNG Environmental Office. [29 CFR 1910.1025(h)(ii), NIOSH 76-130, P.24, II, 2] **(RAC 2)**

4. One person, preferably the range custodian, should be responsible for cleaning the range and discarding debris. The range should be cleaned

ONLY with a HEPA vacuum system or utilizing a wet method. [29 CFR 1910.1025(h)(ii)] **(RAC 2)**

g. ***Personal Protective Equipment (PPE).*** Personnel were observed wearing appropriate hearing protection but did not have safety glasses for firing. Reportedly, the high school units that come to fire utilize their own equipment.

Recommendations.

1. All personnel should wear ANSI approved eye protection. Have additional eye protection and hearing protection available for those that do not have their own. [NGR 385-15, 2-5a, 29 CFR 1910.133 (a-b)]. **(RAC 2)**

h. **Posting of Signs.** No warning signs are posted in the area. No illuminated warning signs to alert personnel while range is in use are available.

Recommendations.

1. The following signs should be posited in or in the vicinity of the range. [NGR 385-15 3-6a,b] **(RAC 2)**:

   a. Eating, drinking, and Smoking are Prohibited
   b. Dry Sweeping is Prohibited
   c. Wash Hands and Face Immediately Following Firing
   d. The Following Ammunition is Authorized for use on this Range
   e. Hearing Protection Must Be Properly Worn During Firing
   f. Proper Safety Glasses/Goggles Must Be Worn During Firing
   g. No Furniture or Storage of Items Permitted in the Range

2. The Following Signs must be posted on the entrance Door:

   a. Noise Hazardous Area
   b. Danger Lead Hazard Area
   c. Pregnant Females are Not Permitted in this Area

2. An illuminated sign should be interlocked with the range ventilation switch and located outside of the firing range to alert individuals outside when the range is in use. [NGR 385-15 2-6c] **(RAC 2)**

i. Range Standing Operation Procedure (SOP). No Range SOP is available for this facility.

Recommendations.

1. A Range Standing Operation Procedure should be written for this facility which includes the following **(RAC 2)**:

    i. Requirements for establishment and maintenance of a visitor's log indicating date, age, and ammunition fired
    ii. Requirements for safety briefing for all individuals before entrance to the range given by a designated range safety officer
    iii. Work practices
    iv. Instructive guidance
    v. Personnel responsibilities for performing, supervising, reviewing, and updating the SOP
    vi. Authorized ammunition
    vii. Posting of signs
    viii. Cleaning and maintenance requirements
    ix. PPE requirements for maintenance, firing, and cleaning of the range.

i. **Recordkeeping.** No compliance program is in place. Range custodian has only been trained on Hazardous Materials and not on lead hazards specific to firing and cleaning of the range.

Recommendations.

1. A visitors log must be maintained that contains the name and age of firer, organization, sign in and out time, type of ammunition, and number of rounds fired. [NGR 385-15 1-16c] **(RAC 2)**
2. A copy of this and any other inspections should be maintained. [NGR 385-15 3-6] **(RAC 2)**
3. An OSHA compliance program must be established and maintained to reduce exposure to or below the permissible exposure limit by means of engineering and work practice controls The written plan should include a description of the operation, ammunition and weapons used, existing controls, groups using the firing range, employee job responsibilities, operating procedures and maintenance practices. A record of previous inspections and air sampling data must also be retained. [29 CFR 1910.1025(e)(3)(i-ii)]. **(RAC 2)**
4. All individuals utilizing the range must be provided with a copy of the SOP or have been briefed on the units' requirements and must sign an agreement to follow the rules. [NGR 385-15 1-15h] **(RAC 2)**
5. State maintenance officers and custodians must be fully trained on an annual basis on the health effects from exposure to lead dust and the appropriate precautions that must be taken. Records verifying this

training must be kept by the range custodian. Each employee who works in a place in which there is a potential exposure to airborne lead at any level shall inform employees of the Content of Appendix A Substance Data Sheet for Occupational Exposure to Lead, and Appendix B Employee Standard Summary of OSHA regulation 1910.1025. Initial training should be performed at least 180 days from date of initial job assignment and annually thereafter. [29 CFR 1910.1025(l)(1)(I-iv), 29 CFR 1910.1200(h)] **(RAC 2)**

6. A range safety officer and custodian should be designated in writing. [NGR 385-15 1-17d] **(RAC 2)**

j. **Ventilation.** The firing range has no plenum or make-up air provided for the exhaust ventilation system. Exhaust fans are located at the firing line and at the bullet trap on the side wall. Smoke tests displayed stagnant air that flowed back behind the firing line and hung in the air. Smoke remained in the firing range after five minutes. Airflow at the firing line was not measured due to the results of the smoke tests. A negative pressure atmosphere is not provided. One heater is used especially during winter months.

Recommendations.

1. The range must have an operational ventilation system that provides makeup air behind the firers and exhausts it at or behind the bullet trap. The airflow must measure at least 50 fpm at all positions in the firing lane. Contact the FMO to replace the current ventilation system so that it meets NGR 385-15 specifications. **(RAC 2)**
2. **The range is classified as unsafe due to deficiencies found concerning the ventilation system. All deficiencies should be corrected before firing may resume.**

k. **Air Sampling.** No air sampling was conducted due to observations of the ventilation system and storage of items in the range area. Request air sampling after other deficiencies have been corrected.

Range Status. This range has been classified as unsafe due to deficiencies in the building envelope, target retrieval system, and ventilation system.

Recommendations.

1. Further use of this range is restricted until deficiencies have been corrected, reinspected, and approved. **(RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH), Industrial Ventilation, A Manual of Recommended Practice, 23rd Edition, 1998.

American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices for 2000.

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Safety Council, Fundamentals of Industrial Hygiene, 4th edition, 1996.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

National Institute for Occupational Safety and Health, Pocket Guide to Chemical Exposures, 2000.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Ametek Air Sampling Pumps, M/N P4LC
BIOS DryCal DC-1 Flow Calibrator.
TSI Air Velocity Meter, M/N VelociCalc 8360
Light Meter

Methodology.

A. *Ventilation.* Ventilation measurements were taken by taking readings at the standing, kneeling, and prone positions at the firing line. Details of locations where ventilation measurements were made can be found in Appendix D.

Assessment Criteria.

A. Ventilation Standards. Ventilation rates were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information.

B. Exposure Standards. Air sampling results for lead were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information. Air sampling results for copper and barium were compared to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Levels (PELs), the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Levels (RELs). See previous page for reference information.

C. Illumination Standards. Illumination measurements were taken in all areas. Measurements were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information.

D. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

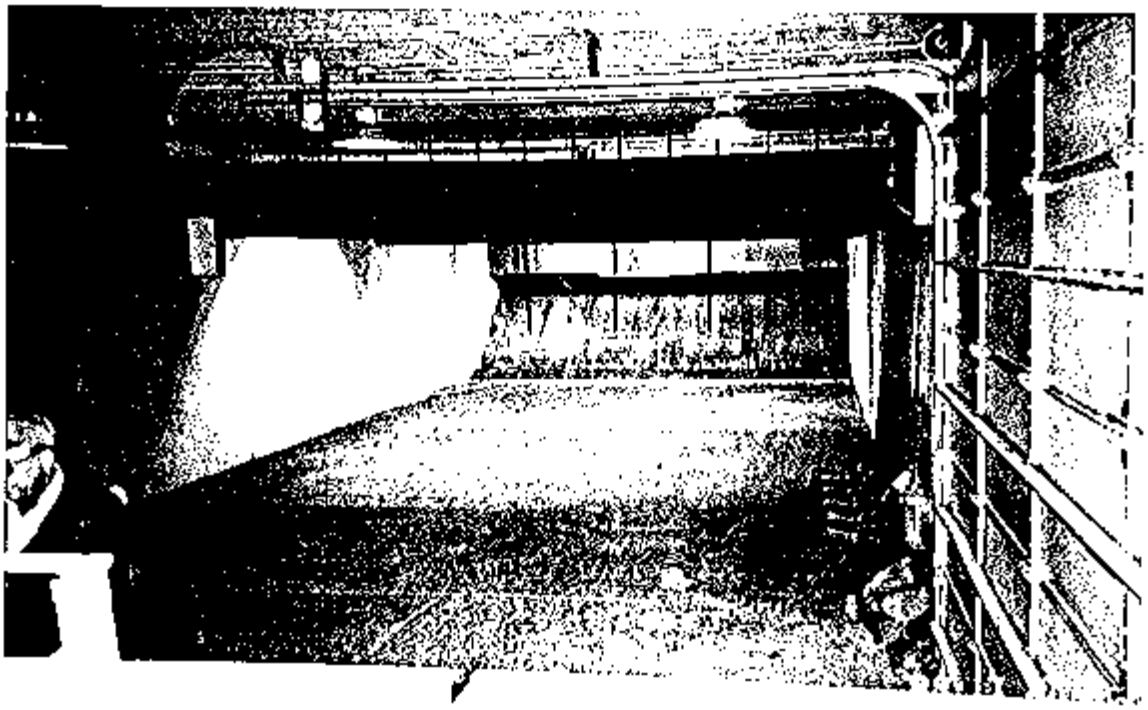
Total Points (sum of A and B, above)	MPC
14-16	A
10-13	B
5-9	C
<5	D

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

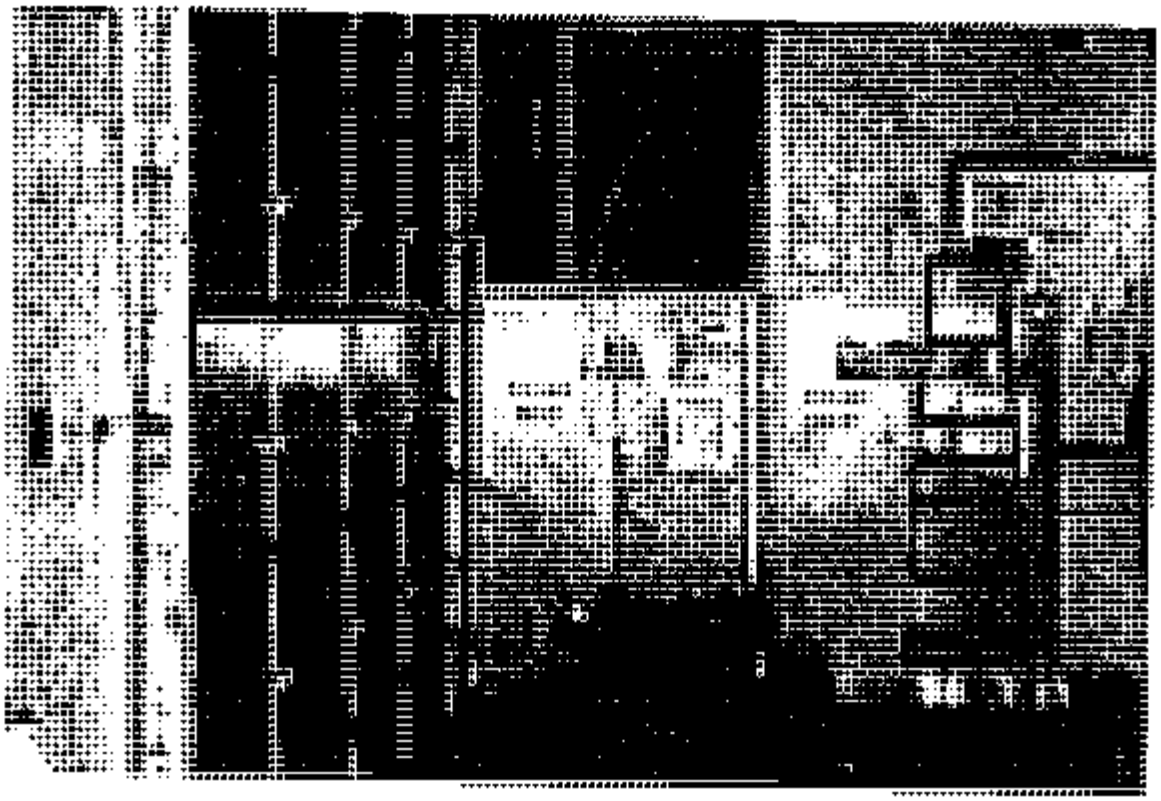
		MISHAP PROBABILITY			
		A	B	C	D
HAZARD SEVERITY	I	1	1	2	3
	II	1	2	3	4
	III	2	3	4	5
	IV	3	4	5	5

APPENDIX C

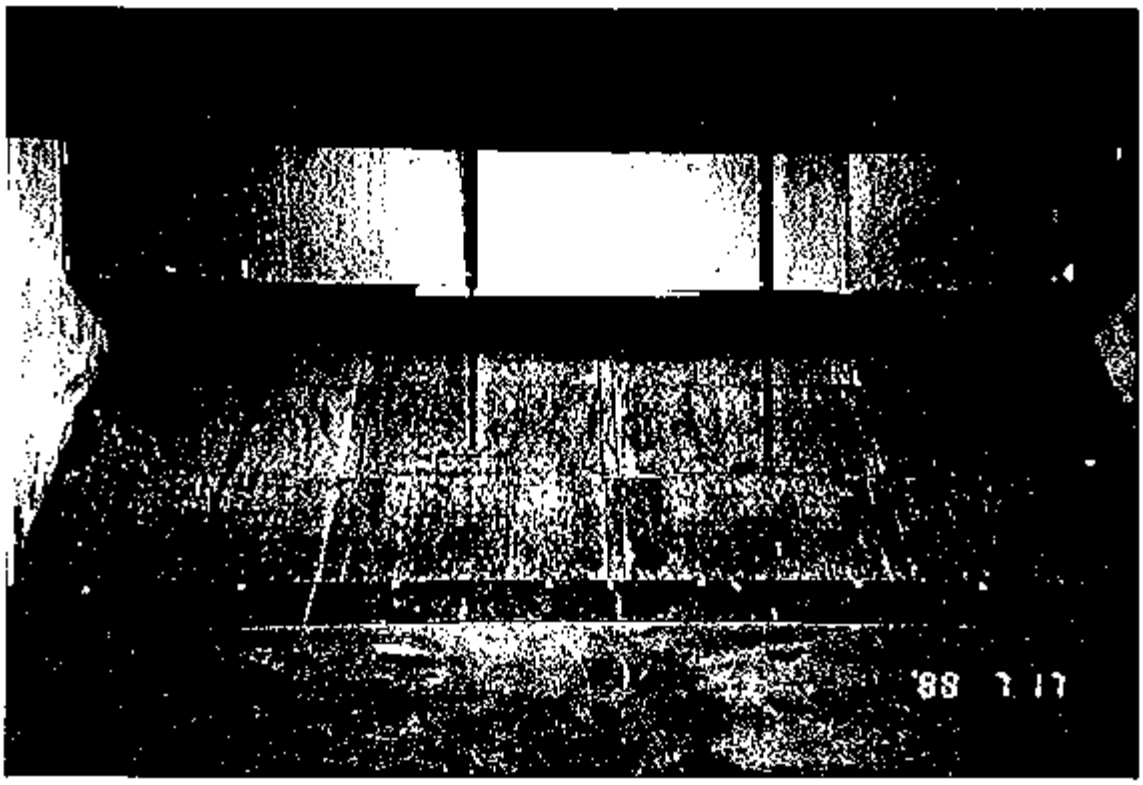
Campbell Indoor Firing Range



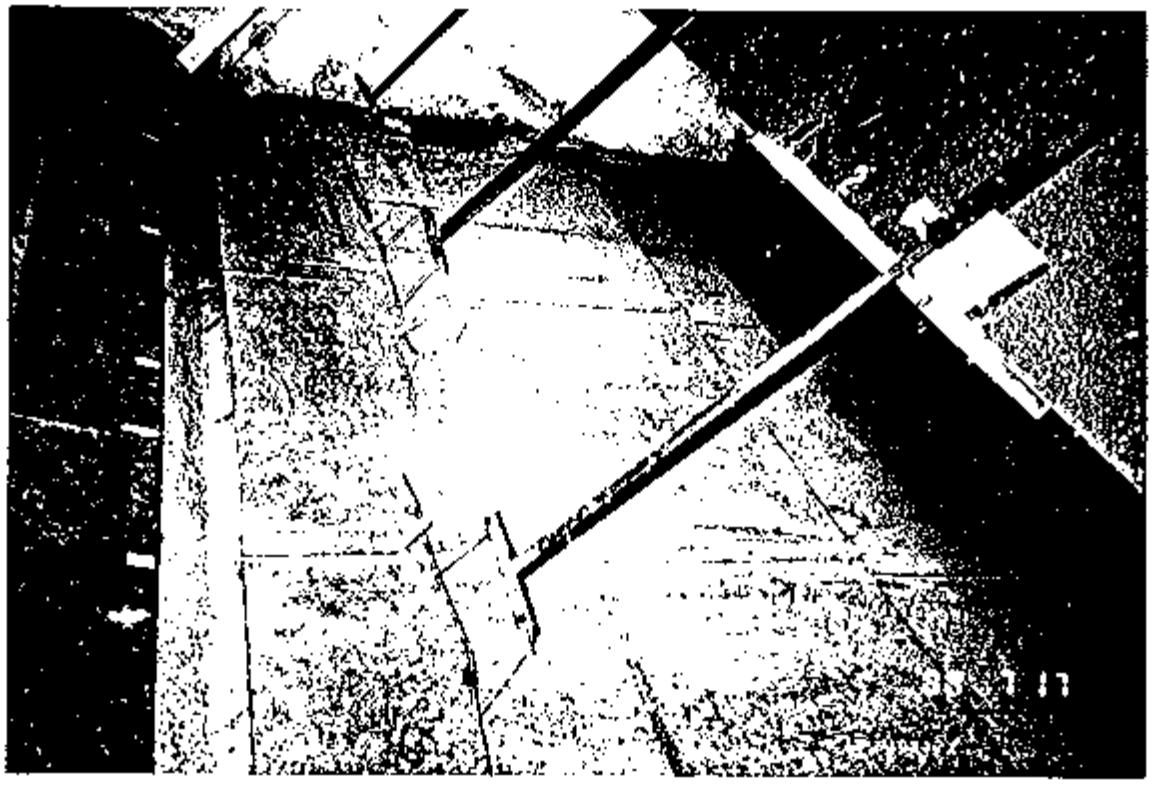
Flammable Storage Cabinets Stored Behind the Firing Line.
Roll Up Door is at the Firing Line



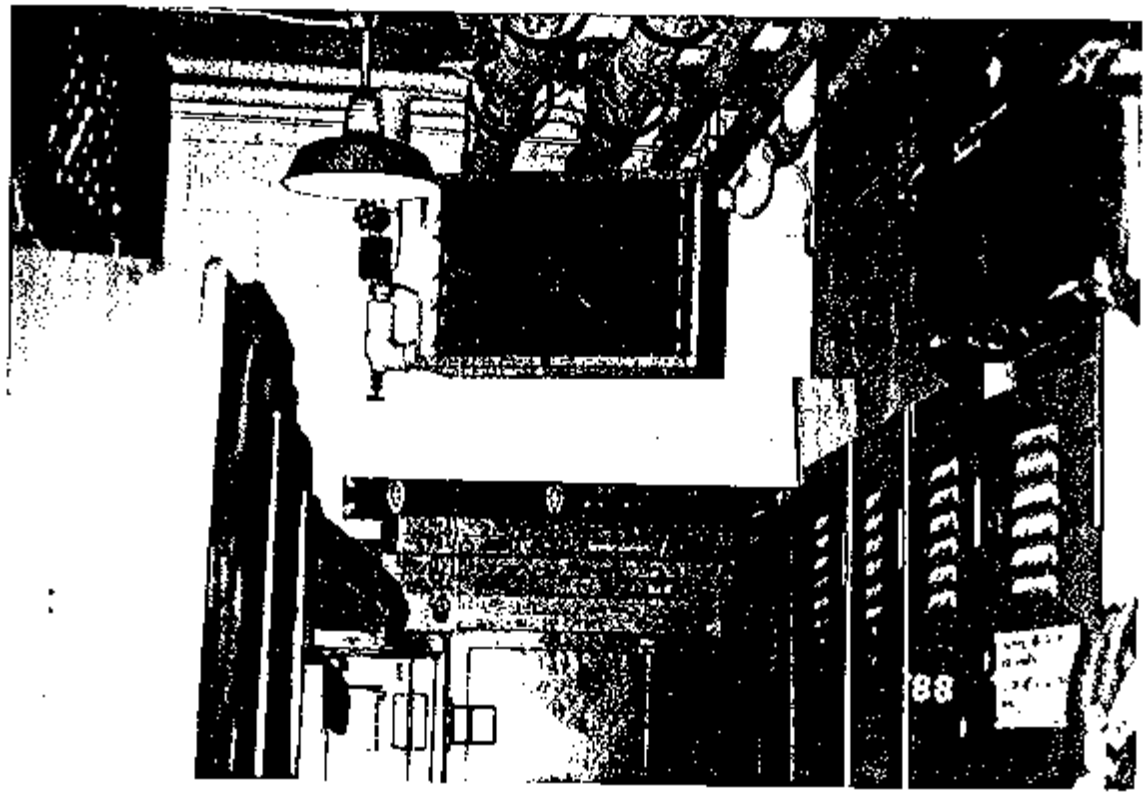
Campbell Indoor Firing Range



Bullet Trap

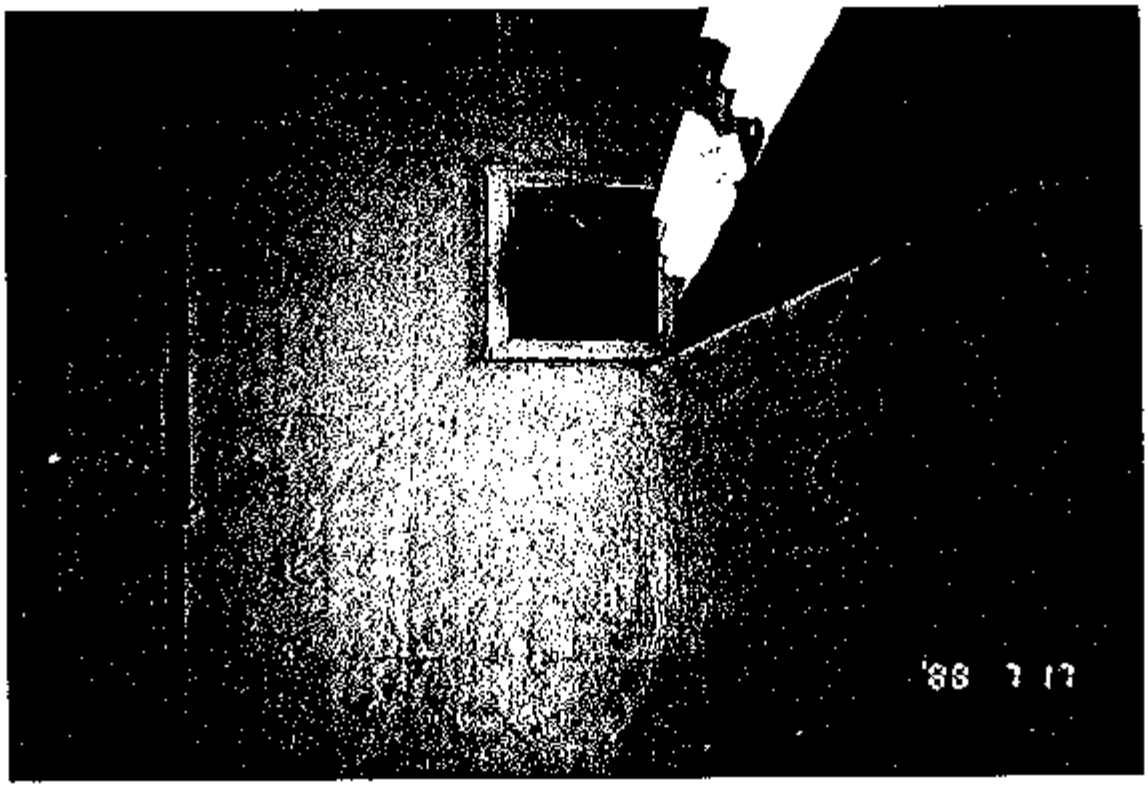


Campbell Indoor Firing Range

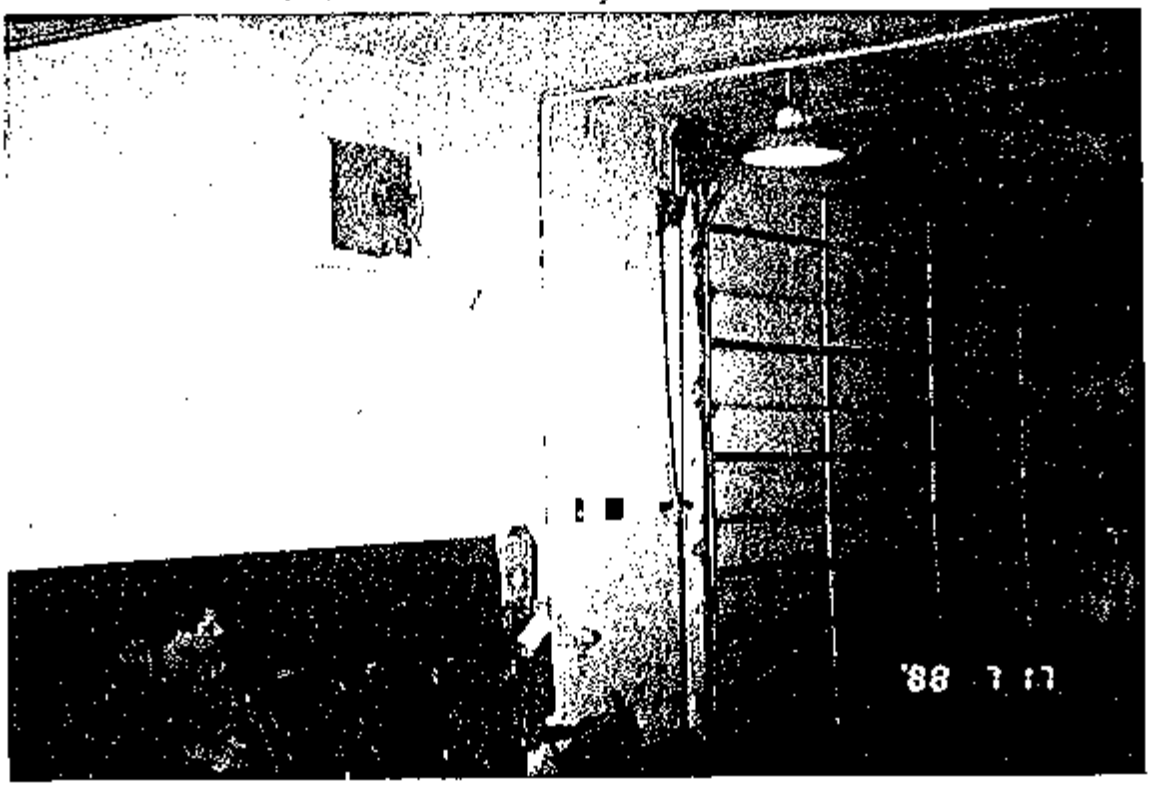


Stored items behind the firing line.

Campbell Indoor Firing Range



Ventilation system exhaust through the side wall.
Smoke tests revealed very little air movement.



NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Campbell Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Green Mountain Armory
Indoor Firing Range

PO BOX 6895, DOUGLASVILLE, GEORGIA 30154
PHONE: 678.596.8509 • FAX: 770.236.6297

Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
This range has been classified as unsafe due to deficiencies in the building envelope, range use, and ventilation measurements.	Further use of this range is restricted until deficiencies in the building envelope, range use, and ventilation measurements have been corrected, reinspected, and approved.	RAC 2
BUILDING ENVELOPE		
Water infiltration is a significant problem in the range.	Water infiltration needs to be adequately controlled and the floor drain permanently sealed.	RAC 3
Items are stored in the plenum room and in front of the plenum in the range.	All stored items should be removed from the range and plenum room and decontaminated.	RAC 2
Access doors have bent weather-stripping.	Repair weather stripping on access doors.	RAC 2
The distance from the firing line to the plenum wall is less than 14'	Move firing line two feet forward to provide the recommended 15 feet between the plenum wall and firing line while maintaining the recommended 50 feet between the firing line and bullet trap.	RAC 3
RANGE LIGHTING		
Lighting causes some shadows just forward of the firing line	Consult FMO to resolve shadows and glare caused by lighting.	RAC 4
No exit lights are provided in the range	Exit lighting should be provided behind the firing line.	RAC 3
BULLET TRAPS		
.177 pellets and are rifles are used on this range and it is unknown whether all of these items are permitted for use on this range.	Contact FMO to obtain information on the caliber weapons that are authorized for firing in this range.	RAC 2
RANGE USE		
Chairs, shelving, and fibrous materials are stored in the plenum. Stored items were wiped and found grossly contaminated.	No items should be stored in the firing range at any time. Stored should be decontaminated and removed.	RAC 2
Mats are brought in by firers for use during firing.	No fibrous items should be brought in during firing as they may become contaminated with lead dust.	RAC 2
The lock to the plenum room door is taped open.	Personnel should not be permitted in the plenum area during firing at any time.	RAC 2
Food and beverage items were found in a waste can within the range. Cigarette butts were found in a labeled can.	Eating, drinking, and use of tobacco products should be strictly prohibited in the firing range.	RAC 3
RANGE MAINTENANCE		
Dry sweeping of the range is	Dry sweeping of indoor firing ranges	RAC 2

FINDINGS	RECOMMENDATIONS	RAC
permitted and brooms indicating such were found in the area.	is prohibited and should not be permitted.	
PERSONAL PROTECTIVE EQUIPMENT		
No personal protective equipment was observed in the area.	All personnel should wear ANSI approved hearing and eye protection.	RAC 2
POSTING OF SIGNS		
Warning signs were not posted in the range.	Post appropriate signs in the vicinity of the range and on the entrance door.	RAC 2
RANGE SOP		
Green Mountain Armory has no approved standing operation procedure	Develop and implement a standing operation procedure	RAC 2
RECORDKEEPING		
No records of range training, maintenance, or cleaning are maintained.	Maintain appropriate records regarding range operations and procedures	RAC 2
VENTILATION		
Supply and exhaust fans are not interlocked with range lighting.	Interlock supply and exhaust fans with range lighting.	RAC 3
Ventilation flow rates were found below 50 fpm in different positions in the firing lanes. The static pressure in the range measured -.33" wg.	Holes in the plenum wall should be one inch in diameter and extended over the entire surface of the plenum wall.	RAC 2
The plenum wall extends 4/5 of the way across the back wall.	The plenum wall should extend across the entire back wall.	RAC 2
Flow rates at the plenum wall were less than the required 400 to 600 fpm	Holes in the plenum wall should be one inch in diameter and extended over the entire surface of the plenum wall.	RAC 2
More than 10 to 15% of the plenum wall is open.	Holes in the plenum wall should be one inch in diameter and extended over the entire surface of the plenum wall.	RAC 2
Smoke tests revealed turbulence at the firing line observable in lanes three and four.	Correct ventilation system deficiencies to provide a uniform and even flow rate.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Green Mountain Indoor Firing Range Survey performed 19 October 2000 at Green Mountain Armory, VT.

BACKGROUND:

Introduction. At the request of Ms Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Green Mountain Indoor Firing Range at the Green Mountain Armory in Vermont. Non-Responsive contract industrial hygienist, with assistance from Ms. Non-Responsive Regional Industrial Hygienist, Mr Non-Responsive Regional Industrial Hygienist, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 19 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Green Mountain Indoor Firing Range is used for weapons firing and qualification. The range is used approximately two nights per week by the Burlington rifle and pistol club, of which some members are 12 and 13 year old firers. The range has six lanes and a mechanical ventilation system with a plenum that extends 4/5 of the way across the back wall.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. A range inspection checklist found in National Guard Regulation 385-15, which addresses Indoor Firing Range use and maintenance, was completed for the range. Smoke candles were utilized to observe airflow patterns in the range. Ventilation studies and air sampling was performed to quantify performance of the range and its effectiveness in reducing employee exposure to lead dust. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap , where lead dust is deposited.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. This particular indoor firing range is of particular concern due to its use by adolescent firers. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

*a. **Building Envelope.*** Pipes, conduits, and other projecting surfaces are adequately baffled. Water infiltration was noticeable and confirmed by personnel. There is one covered floor drain in the area, but personnel report that water seeps into the range and drains during very rainy weather. Chairs, shelving, and fibrous materials, such as canvas items and clothing, are stored in the plenum. The entrance door to the range is not adequately weather-stripped. The current weather stripping is bent and would not adequately prevent leakage out of the range. The distance from the firing line to the plenum wall is less than 14'. For optimum air distribution, a minimum of 15 feet from the firing line to the plenum wall is recommended.

Recommendations.

1. Water infiltration into the range needs to be controlled so that wastewater contaminated with lead does not leak into other areas of the building. Bent weather-stripping should be replaced to help prevent infiltration of contaminated dust and water into areas outside of the range. The floor drain should be completely sealed to prevent water from the range from draining into the sewer system and to prevent water leaking into the range through the drain. Any water should be immediately cleaned up using appropriate maintenance protocol and disposed of accordingly. **(RAC 2)**
2. Weather-strip all access doors to the range to prevent leakage of lead dust and debris into outlying areas. [385-15 2-2a(2)(b)] **(RAC 2)**
3. No items should be stored in the firing range at any time. Stored items can become contaminated with lead dust and will increase the exposure to anyone who moves or touches stored items. Remove and decontaminate items using a trisodium phosphate and water solution (See below in section concerning Range Maintenance)[NGR 385-15 2-3a, 2-4h; NGR 385-15 2-4] **(RAC 2)**
4. Move firing line two feet forward to provide the recommended 15 feet between the plenum wall and firing line. The distance from the firing line to the bullet trap should remain at least 50 feet. [NIOSH 76-130, p. 13] **(RAC 3)**
5. **The range is classified as unsafe due to deficiencies found concerning the building envelope. All deficiencies should be corrected before firing may resume.**

*b. **Range Lighting.*** Range lighting is relatively uniform but does cause some shadows down range. Lighting measures an average 100 FC at the targets and 55 FC in all other areas. All lighting is adequately protected by baffles. No exit lights are provided for the range.

Recommendations.

1. Consult the FMO to resolve shadows and glare caused by lighting. **(RAC 4)**
2. Exit lights should be provided behind the firing line to adequately guide personnel out of the range in the case of an emergency or power outage. [CEHND 110-1-18, 3-4c(c)] **(RAC 3)**

e. ***Bullet Traps.*** An inclined plate bullet trap is permanently installed and is designed for .22-caliber use. .22 caliber pistols and long rifles, .177 pellets, and air rifles are used on the range. It is unknown whether all of these items are permitted for use on this range. The bullet trap measures ¼ " thick and adequately prevents ricochets. The bullet trap is in good shape and is smooth without any seams or overlapping.

Recommendations.

1. Contact FMO to obtain the calibers that may be used with the installed bullet trap to be sure that all ammunition used is authorized for firing. [NGR 385-15 2-2d(1)(a)] **(RAC 2)**
2. The bullet trap should be adequately maintained. Rust or paint chips may cause ricochets. A thin coating of oil should be applied every 3 months for moderate firing, sooner if heavy firing occurs (10W30 or 3 in 1). **DO NOT APPLY GREASE. (RAC 3)**
3. Bullet collection bins should not be allowed to get over ¾ full. Contact the VT ARNG State Environmental Office prior to emptying for disposal instructions. **(RAC 3)**

d. ***Targets and Target Carriers.*** Target retrieval systems were provided for each lane and are in good working order. Large cardboard targets are used for personnel during firing procedures.

Recommendations.

1. There are no recommendations for targets or target retrieval systems at this time.

e. ***Range Use.*** The range is used approximately two nights per week by the Burlington rifle and pistol club which allows 12 and 13 year old firers. Chairs, shelving, and fibrous materials, to include canvas items and clothing, are stored in the plenum. Tables, chairs, and computer items are stored in front of the plenum. Stored items were wiped to test for lead contamination. Samples show that these items are grossly contaminated, ranging from 549 to 54000 micrograms/square foot. Personnel site the reason for storing items in the ranges are lack of space in the facility. Mats are brought in by firers during shooting and are removed after shooting. The lock to the plenum room

door is taped to keep the door open. Food and beverage items were found in a waste can within the range. Cigarette butts were found in a labeled can on the table stored in front of the plenum.

Recommendations.

1. No items should be stored in the firing range at any time. Stored items can become contaminated with lead dust and will increase the ris of exposure to anyone who moves or touches stored items. [NGR 385-15 2-3a, 2-4h] **(RAC 2)**
2. No items should be stored in front of the plenum wall, which will disturb air flow while the ventilation system is running. [NGR 385-15 2-4a] **(RAC 2)**
3. No fibrous items such as mats or carpeting should be brought in during shooting as they may become contaminated with lead dust. [NGR 385-15 2-3a, 2-4h] **(RAC 2)**
4. All items currently stored in the range and plenum area must be thoroughly decontaminated before storage and use by other personnel. Items should be discarded as hazardous waste only as a last resort. [NG PAM 385-16 , 10]**(RAC 2)**
5. Personnel should not be permitted in the plenum area during firing at any time. [NGR 385-15 2-4a] **(RAC 2)**
6. Only range custodians are allowed access downrange. Unauthorized personnel should not be permitted downrange in order to minimize their exposure to lead dust. [NGB 385-15 2-4f] **(RAC 2)**
7. Immediately remove the cigarette butt can from the indoor firing range. Eating, drinking, and use of tobacco products without washing hands and face prior to these activities can lead to ingestion of lead dust that have settled on hands, surfaces, or food and drink. Oral ingestion may represent a major route of exposure in contaminated workplaces. All personnel should be strictly prohibited from consuming food and beverages in the area, using tobacco products, or applying cosmetics (i.e. lip balm). [29 CFR 1910.1025 (i)(1)]. **(RAC 2)**

f. ***Range Maintenance.*** Dry sweeping of the range was reported and brooms were found in the range that indicate dry sweeping of the area.

Recommendations.

1. The indoor firing range should be cleaned with the ventilation system operating to prevent dust and debris from entering the worker's breathing zone. Floor areas from behind the firers to the firing line and 15 feet downrange should be cleaned at least every three months or after firing if the range is not used as often. [NIOSH 76-130, p.24, II, 1] **(RAC 2)**

2. Dry sweeping and cleaning bullet traps by pouring or shoveling bullet debris into waste buckets causes settled lead dust to become airborne and possible inhaled. **Dry sweeping of indoor firing ranges is prohibited.** A High Efficiency Particulate Air (HEPA) filtered vacuum system is the recommended choice for range cleanup of lead dust and particles only (no bullet casings). If a HEPA vacuum cannot be acquired a wet method should be used which includes a solution of detergent and water. Two containers should be used; one to wet the area, and the other to rinse the applicator after the dust has been wiped from the surface. Water should be changed often to prevent reapplication of contaminated water. Wastewater should be left to evaporate and the residue and any applicators should be disposed under guidance from the VT ARNG Environmental Office. [29 CFR 1910.1025(h)(ii), NIOSH 76-130, P.24, II, 2] **(RAC 2)**
3. One person, preferably the range custodian, should be responsible for cleaning the range and discarding debris. The range should be cleaned **ONLY** with a HEPA vacuum system or utilizing a wet method. [NGR 385-15 2-2b, 29 CFR 1910.1025(h)(ii)] **(RAC 2)**

g. ***Personal Protective Equipment (PPE).*** No personal protective equipment was observed in the area. .

Recommendations.

1. All personnel should wear ANSI approved hearing and eye protection. Have additional eye protection and hearing protection available for those that do not have their own. [NGR 385-15, 2-5a, 2-5 b, 29 CFR 1910.133 (a-b), 29 CFR 1910.95 a]. **(RAC 2)**

h. **Posting of Signs.** No warning signs are posted in the area. An illuminated warning sign to alert personnel while range is in use is present and visible at the outside door. The illuminated sign is interlocked with range lighting. An acknowledgement book is provided covering the Standing Operation Procedures (SOP) items. Firing lanes are numbered only at the firing line. No signs are posted outside of the access door to the bullet trap, warning personnel not to enter during range operation.

Recommendations.

1. The following signs should be posited in or in the vicinity of the range and of the access door to the bullet trap. [NGR 385-15 3-6a,b] **(RAC 2)**:
    a. Eating, drinking, and Smoking are Prohibited
    b. Dry Sweeping is Prohibited
    c. Wash Hands and Face Immediately Following Firing
    d. The Following Ammunition is Authorized for use on this Range

e. Hearing Protection Must Be Properly Worn During Firing
f. Proper Safety Glasses/Goggles Must Be Worn During Firing
g. No Furniture or Storage of Items Permitted in the Range

2. The Following Signs must be posted on the entrance door to the range and to the access door of the bullet trap:
   a. Noise Hazardous Area
   b. Danger Lead Hazard Area
   c. Pregnant Females are Not Permitted in this Area
3. An illuminated sign should be interlocked with the range ventilation switch and located outside of the firing range to alert individuals outside when the range is in use. [NGR 385-15 2-6c] **(RAC 4)**
4. Firing lanes should be numbered at both the firing line and at the bullet trap. [NGR 385-15 2-6d] **(RAC 4)**

i. Range Standing Operation Procedure (SOP). No Range SOP with all requirements is available for this facility as approved by the State Safety Office.

Recommendations.

3. A Range Standing Operation Procedure should be written for this facility which includes the following **(RAC 2)**:

   i. Requirements for establishment and maintenance of a visitor's log indicating date, age, and ammunition fired
   ii. Requirements for safety briefing for all individuals before entrance to the range given by a designated range safety officer
   iii. Work practices
   iv. Instructive guidance
   v. Personnel responsibilities for performing, supervising, reviewing, and updating the SOP
   vi. Authorized ammunition
   vii. Posting of signs
   viii. Cleaning and maintenance requirements
   ix. PPE requirements for maintenance, firing, and cleaning of the range.

j. **Recordkeeping.** Records kept by range custodian are a visitor's log with name of firer, organization, sign in and sign out times, and types of ammunition fired. Range regulations are posted above the log in sheet. Range custodian was not available to provide copies of initial and previous inspection information and any air-sampling data. No OSHA compliance program is in place. Range custodian has not been trained on lead hazards specific to firing and cleaning of the range.

Recommendations.

a. A visitor's log must be maintained that contains the name and age of firer, organization, sign in and out time, and type of ammunition, and number of rounds fired. [NGR 385-15 1-16c] **(RAC 2)**

b. A copy of the visitor's log and any other inspections should be maintained. [NGR 385-15 3-6] **(RAC 2)**

c. An OSHA compliance program must be established and maintained. The written plan should include a description of the operation, ammunition and weapons used, existing controls, groups using the firing range, employee job responsibilities, operating procedures and maintenance practices. A record of previous inspections and air sampling data must also be retained. [29 CFR 1910.1025(e)(3)(i-ii)]. **(RAC 2)**

d. All individuals utilizing the range must be provided with a copy of the SOP or have been briefed on the units' requirements and must sign an agreement to follow the rules. [NGR 385-15 1-15h] **(RAC 2)**

e. State maintenance officers and custodians must be fully trained on an annual basis on the health effects from exposure to lead dust and the appropriate precautions that must be taken. Records verifying this training must be kept by the range custodian. Each employee who works in a place in which there is a potential exposure to airborne lead at any level shall inform employees of the Content of Appendix A, Substance Data Sheet for Occupational Exposure to Lead, and Appendix B, Employee Standard Summary, of OSHA regulation 1910.1025. Initial training should be performed at least 180 days from date of initial job assignment and annually thereafter. [29 CFR 1910.1025(l)(1)(I-iv), 29 CFR 1910.1200(h)] **(RAC 2)**

f. A range safety officer and custodian should be designated in writing. [NGR 385-15 1-17d] **(RAC 2)**

k. **Ventilation.** The range is equipped with an operational ventilation system, with 100% of the make-up air exhausted at the bullet trap. Supply and exhaust fans are not interlocked with range lighting. Ventilation Flow rates were found below 50 fpm in the standing positions in lanes 1, 3, and 4, in the kneeling position in lanes 2,3,4 and in the prone position in lane 2. (See diagram in Appendix D for detailed measurements). Flow rates were found greater than 75 fpm in lane 6. The static pressure in the range measured -.33" wg. The recommended static pressure range is -.05 to .15" wg.

The plenum wall extends approximately 4/5 of the way across the back wall and flow rates at the plenum wall did not have the required 400 to 600 fpm. More than 10-15% of the plenum wall is open. Smoke tests revealed turbulence at the firing line, observable in lanes one, two, and three. Smoke originating at the firing line curled back behind the firing line instead of moving downrange. This indicates that during firing, lead dust would blow back into the firer's face.

Recommendations.

a. Interlock supply and exhaust fans with range lighting so that the ventilation system operates at all times during occupancy of the range. [CEHND 110-1-18, 3-4a] **(RAC 3)**

b. Results of ventilation and smoke tests indicate that adequate flow rates are being provided by the fan but are not being evenly and uniformly distributed to move lead dust downrange and away from firer's breathing zone. The purpose of the plenum wall is to provide enough resistance to straighten the airflow and allow it to be distributed evenly and uniformly downrange. The plenum wall should be retrofitted so that it extends the entire length of the back wall. The holes should be made one inch in diameter and evenly distributed across the surface of the plenum wall and centered in a four-inch square area. The airflow must measure at least 50 fpm at all positions in the firing lane. **(RAC 2)**

l. **Air Sampling.** Air sampling was not conducted due to ventilation results and the amount of storage in the plenum and range. Stored items could not easily be moved to accommodate firing.

Recommendations.

a. Air Sampling should be conducted after changes required in the ventilation system have been made and stored items have been removed and decontaminated. [NGR 385-15 1-27 c] **(RAC 2)**

Range Status. This range has been classified as unsafe due to deficiencies in the building envelope and ventilation systems.

Recommendations.

1. Further use of this range is restricted until deficiencies have been corrected, reinspected, and approved. **(RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH), Industrial Ventilation, A Manual of Recommended Practice, 23rd Edition, 1998.

American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values for Chemical Substances and Physical Agents and Biological Indices for 2000.

AR 40-5, Preventative Medicine. 15 October 1990.

AR 385-10, The Army Safety Program. 23 May 1988.

National Safety Council, Fundamentals of Industrial Hygiene. 4th edition. 1996.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program. 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

National Institute for Occupational Safety and Health, Pocket Guide to Chemical Exposures, 2000.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Ametek Air Sampling Pumps, M/N P4LC
BIOS DryCal DC-1 Flow Calibrator.
TSI Air Velocity Meter, M/N VelociCalc 8360
Light Meter

Methodology.

A. *Ventilation.* Ventilation measurements were taken by taking readings at the standing, kneeling, and prone positions at the firing line. Details of locations where ventilation measurements were made can be found in Appendix D.

Assessment Criteria.

A. *Ventilation Standards.* Ventilation rates were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information.

B. *Exposure Standards.* Air sampling results for lead were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information. Air sampling results for copper and barium were compared to the Occupational Safety and Health Administration (OSHA) Permissible Exposure Levels (PELs), the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), and the National Institute of Occupational Safety and Health (NIOSH) Recommended Exposure Levels (RELs). See previous page for reference information.

C. *Illumination Standards.* Illumination measurements were taken in all areas. Measurements were compared with the NGR 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges. See previous page for Reference information.

D *Risk Assessment Codes.* Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX D

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

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

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

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

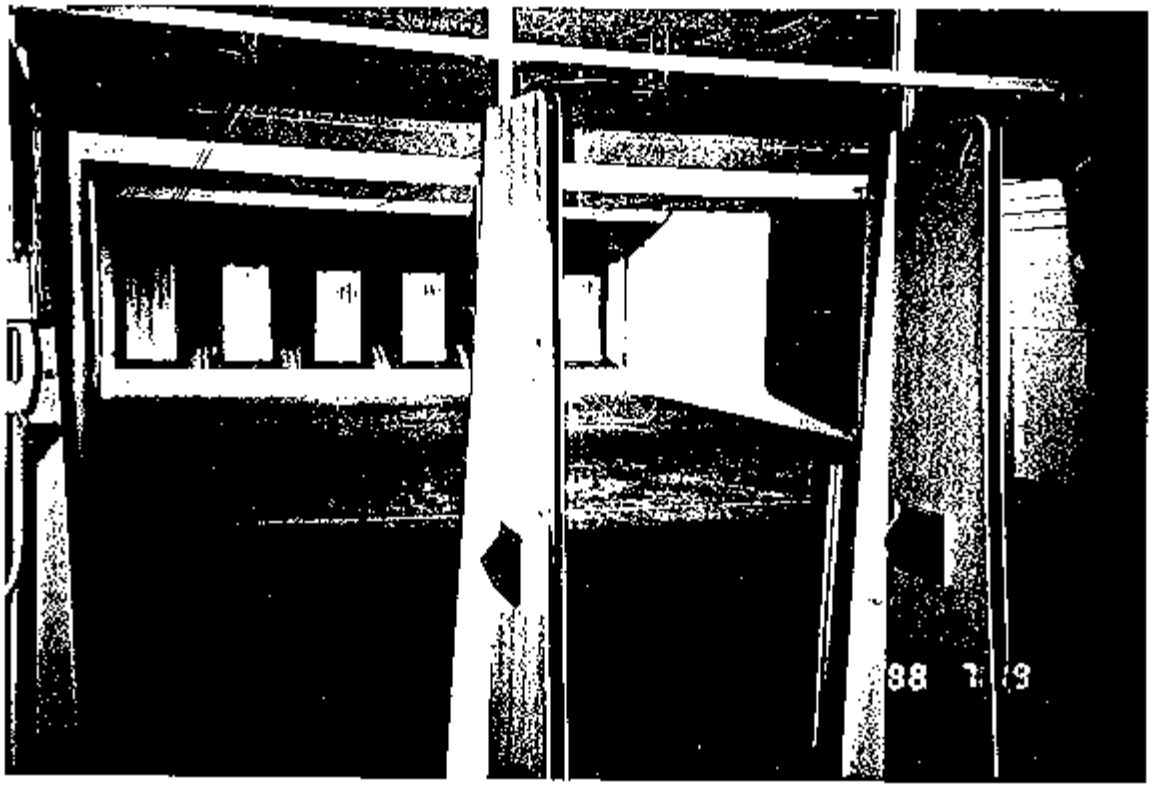
APPENDIX C

Green Mountain Indoor Firing Range[1]

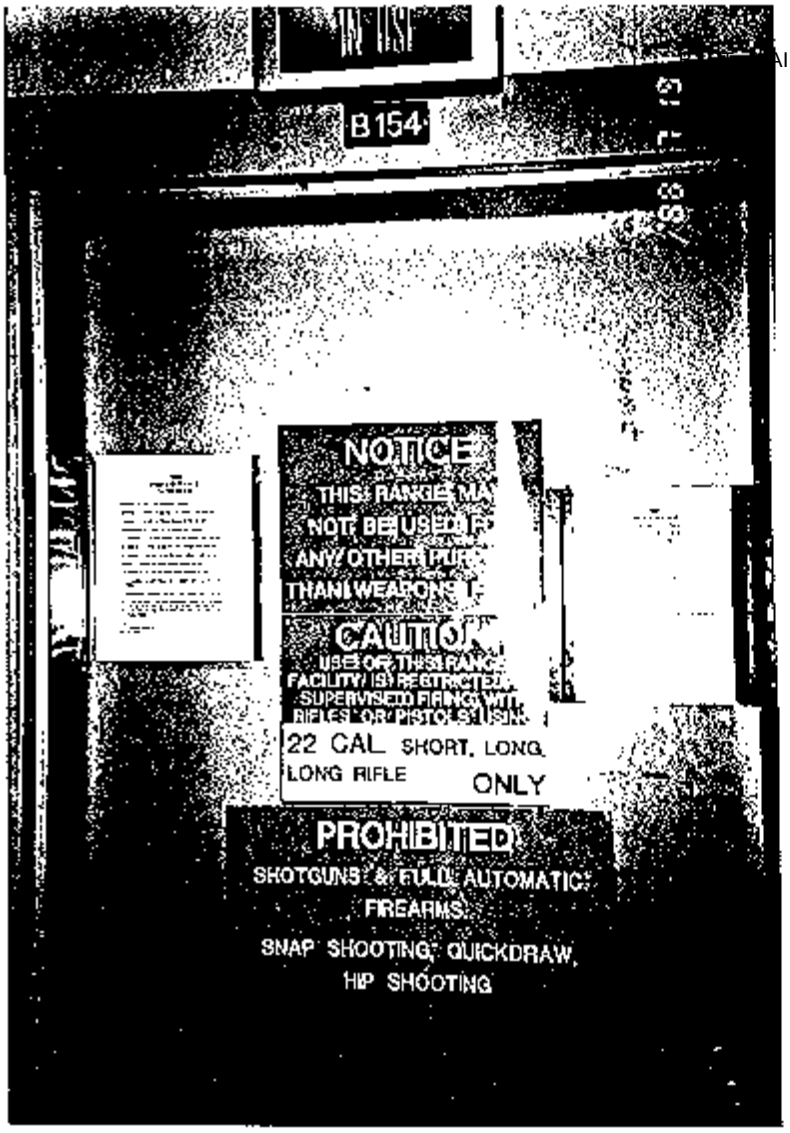
[1] . Denotes turbulence.

Environmental Management Solutions

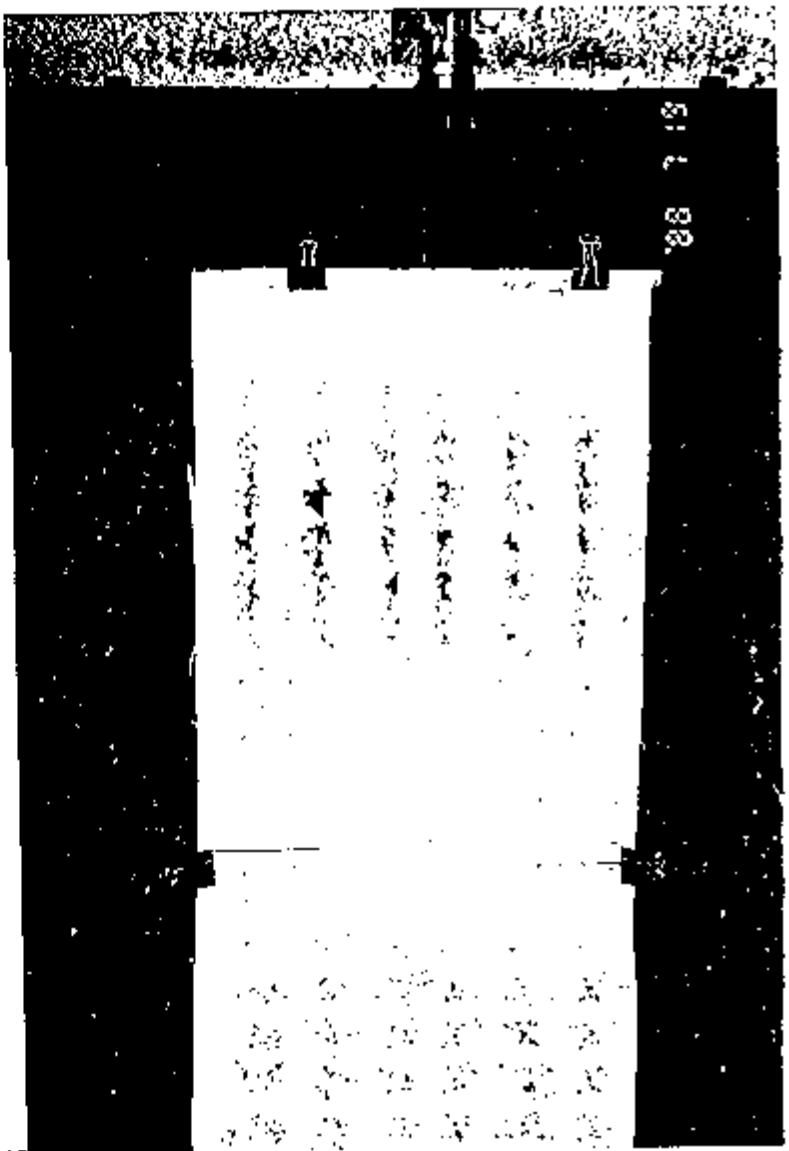
Green Mountain Armory



Floor drain allows water seepage into the range.

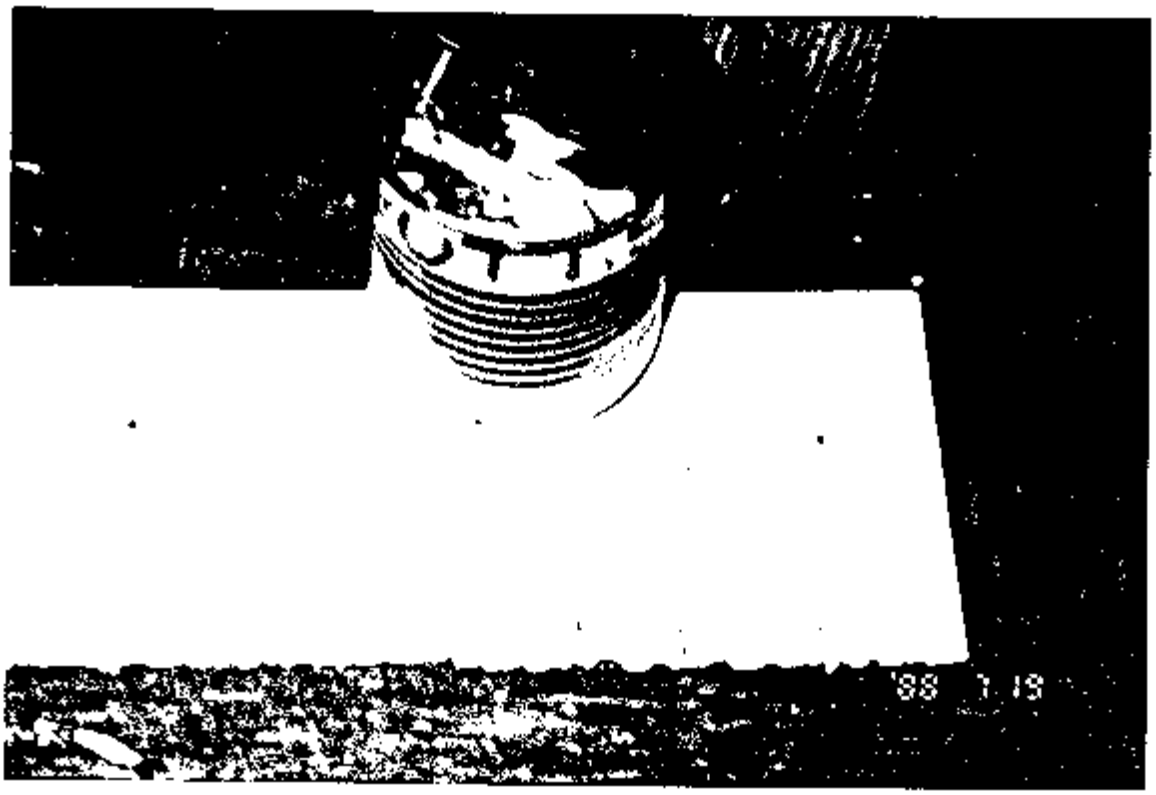


"Range In Use" Illuminated Sign.
Warning signs posted on entrance door.



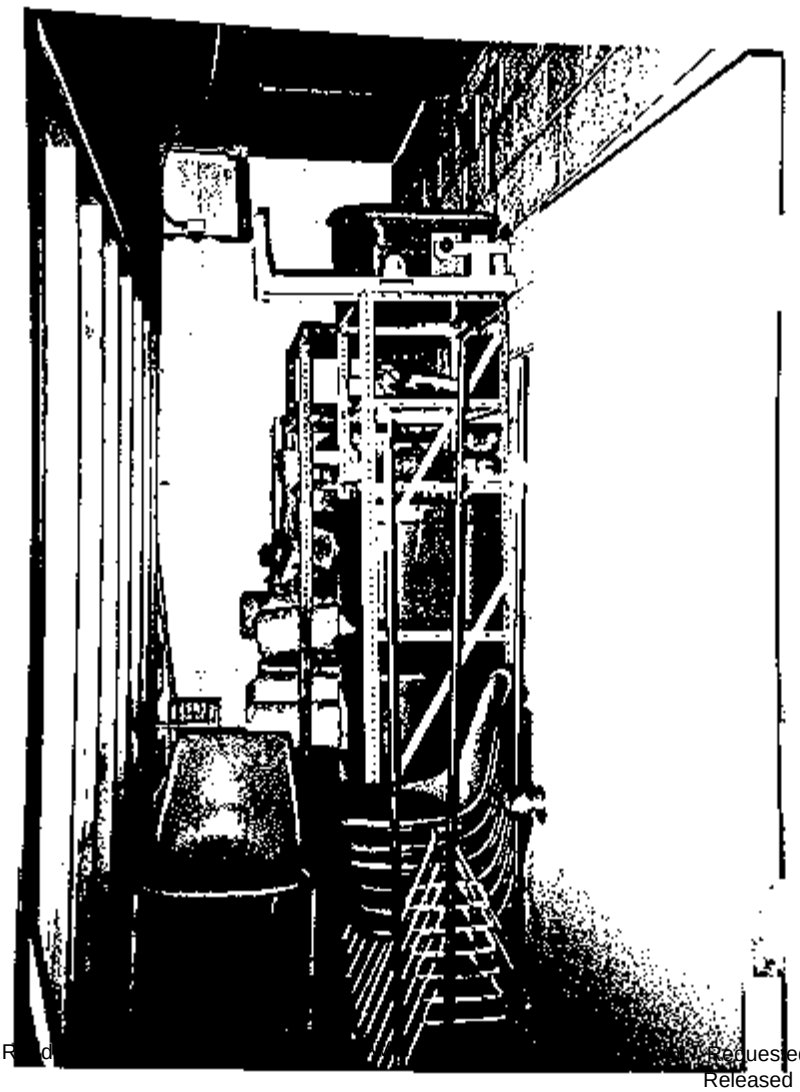
Cardboard Targets.

Cigarette Butt Cans



Food and Beverage Items Found in Waste Can

Both the range and plenum areas are used for storage.



APPENDIX D

Ventilation Measurements
Indoor Firing Range Lanes

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Standing	*3*	61	31	15	72	121
Kneeling	*74*	16	14	13	53	129
Prone	*40*	3	53	67	67	143

APPENDIX E

Wipe Sampling Results
Green Mountain IFR

Sample Number	Location	Micrograms/Sample	Micrograms/sq. ft.
GM-01	Table at plenum wall	94	79524
GM-02	Computer cart at plenum wall	1400	12600
GM-03	Top of locker plenum room	4800	43200
GM-04	Storage shelving, 5th shelf in plenum room	6000	54000
GM-05	In bathroom on top of towel dispenser	210	1890
GM-06	On floor outside of plenum door	240	2160
GM-07	On floor outside of the range	180	1620
GM-08	Blank	61	549

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Green Mountain Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

Ludlow Armory
Indoor Firing Range

PO BOX [illegible] DOUGLASVILLE GEORGIA [illegible]
PHONE [illegible] • FAX [illegible]

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Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
The Ludlow indoor firing range has not been fired on since 1992. The range is listed as active, however offices have been put in this area as well as storage items to include lockers.	An official decision as to the status of this range should be immediately determined. If the range is to remain active, it must meet requirements set forth in NGR 385-15. If the range is to be converted, it must be adequately cleaned and decontaminated before employee use can resume.	RAC 2
Ten out of twenty wipe sample results were above the maximum allowable limit of 200 micrograms per square foot. It is unclear what type of protocol janitors cleaning this range used.	If the range is to be converted, it must be cleaned in accordance with National Guard Regulations before employee use can resume.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Ludlow Indoor Firing Range Survey performed 17 October 2000 at Ludlow Armory, VT.

BACKGROUND:

Introduction. At the request of Ms Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Ludlow Armory in Vermont. Non-Responsive contract industrial hygienist, Ms. Non-Responsive and Mr Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 17 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Ludlow Indoor Firing Range has not been fired on since 1992 and was converted for office use approximately two years ago. The range has not officially been closed and is still listed as an active range. The offices are used during weekends approximately once per month. Janitors cleaned the range and painted the walls three to four times, however, the protocol used by the janitorial staff was not documented. It was unclear during the time of the survey whether or not the ventilation system had been removed.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. The range was evaluated using the wipe sampling protocol used in the National Guard Pamphlet 385-16, which addresses Indoor Firing Range conversion to other uses. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited. Lead deposits resulting from firing activities can build up in a firing range over time and must be adequately cleaned and sealed before the range is used for other purposes. If the range is not properly cleaned, the potential for exposure to employees who use the converted area remains.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Ten of the twenty wipe samples taken inside the range exceeded the limit of 200 micrograms per square foot. It is unknown, what type of protocol was used by janitors cleaning this range and it is apparent that lead contamination still exists. Lockers and offices were found in this area and wipe sample results show high levels of contamination. The range is still listed as active, but has been converted to an office and storage area. If the range is to remain active, then all stored and office items must be removed and the range cannot be used for any other purpose than as a firing range. If the range will be officially closed and converted, the indoor firing range should be cleaned so that it is as free of lead dust as possible before the area is used for other purposes to include office space and storage. The following protocol should be used to clean the range and decontaminate items currently stored inside.

Recommendations.

1. Post signs restricting personnel from the range until it has been appropriately cleaned. **(RAC 2)**
2. No stored items should be handled or used until they have been thoroughly decontaminated. **(RAC 2)**
3. No eating, drinking, or use of tobacco products should occur in the area. [29 CFR 1910.1025 (i)(1)] **(RAC 2)**
4. Decide whether the range will be used for range activities (i.e. weapons qualification and firing) or if it would be better suited for storage and office space. The indoor firing range should not be used for both activities. [NGR 385-15, NG PAM 385-16] **(RAC 2)**

    a. If the range is to remain active, the range cannot be used for any purpose other than firing. No equipment or furniture can be stored or maintained in the range. The range must meet all requirements of the National Guard Regulation 385-15 regarding Indoor Firing Ranges. Contact the Regional Industrial Hygiene Office regarding requirements. [NGR 385-15 1-18a, 1-17d] **(RAC 2)**
    b. If the range is to be used as a storage area and office space, it must be thoroughly decontaminated, reevaluated, and approved prior to its use. Follow all described procedures for cleaning and decontamination of the range and all stored items found in Appendix C. **Contact the Regional Industrial Hygiene Office for approval and reevaluation prior to and after cleaning. (RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Rite Aid Towelettes with Benzalkonium Chloride 1:750, 5% Denatured Alcohol
4" X 4" Template

Methodology.

A. *Wipe Samples.* Wipe samples were taken utilizing the protocol as set forth by NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. Details of locations where wipe samples were taken can be found in Appendix D.

Assessment Criteria.

A. Wipe Samples. Wipe sample results were compared with Ventilation rates were compared with the NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. See previous page for Reference information.

B. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

APPENDIX C

Decontamination and Cleaning Protocol

1. Ensure that all procedures listed below comply all federal, state, and local regulations. Consult the Regional Industrial Hygiene Office and State Environmental Office for further guidance.

2. **Ventilation System**
   i. The range ventilation system must be in operation during all cleaning activities. If no ventilation system is available all doors and windows must be kept sealed to prevent contamination of other areas.

3. **Materials**
   i. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup. If a HEPA vacuum cannot be obtained a wet method, detailed below, should be utilized. **A high-pressure water system or dry sweeping may not be used.**
   ii. A cleaning solution containing detergent and water is recommended. New solutions of detergent and water should be mixed frequently.
   iii. Two containers should be used; one for wetting the applicator (rags, sponge, mop) and the other for rinsing once the dust has been wiped from the surfaces.
   iv. Wastewater in containers can be left to evaporate. Any waste left in the buckets and applicators should be disposed of as hazardous waste. Consult the Environmental Office for appropriate disposal instructions.
   v. Personnel responsible for decontamination of the range and stored items should be provided with a full face air purifying respirator with a N100 filter or HEPA filter cartridge providing that all requirements for placing employees in respiratory protection have been met as detailed in 29 CFR 1910.134. Employees should be provided with protective coveralls with hood and shoe covers (i.e. Tyvek™ full body suit). Protective clothing should be hanged daily at the end of the shift and more frequently if the suit becomes grossly contaminated. If cotton coveralls are provided then the employer must provide for maintenance and laundering of protective clothing. Protective clothing should not be taken home and prior to leaving the work area, personnel should thoroughly HEPA vacuum clothing to prevent lead dust from leaving the area. Work and street clothing should not be stored together.

4. **Order of Cleaning**
   i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. All surface areas in the range must be cleaned. Stored items must be decontaminated prior to removal.
   ii. After removing the sand and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plates should be cleaned.
   iii. The ceiling, lights, baffles, retrieval system, heating systems, and ventilation ducts should be cleaned.
   iv. Acoustical material should be vacuumed instead of being painted over, A Toxic Characteristic Leaching Procedure (TCLP) may need to be used for

acoustical material and the like to determine if the material need to be classified as hazardous and disposed of accordingly. The Environmental Office should be contacted regarding this testing.

v. The floor should be the last surface cleaned starting at the bullet trap and ending behind the firing line. Concrete floors should be sealed with deck enamel and linoleum on tile floors should be waxed.

vi. All walls should be painted, preferably with a sealant, that will help prevent leaching of lead after covering.

vii. Following the wet cleaning of the area and after all surfaces have been allowed to dry thoroughly, a HEPA vacuum should be used on all surfaces, until no dust or residue can be seen. A through inspection to detect surface dust should be made following cleanup.

viii. The Regional Industrial Hygiene Office should be contacted for clearance sampling and to approve the range for converted use.

5. **Decontamination of stored items.**

i. All stored items must be decontaminated before removing them from the range. Stored equipment next to the bullet trap and firing line should be decontaminated first.

ii. A HEPA vacuum or wet cleaning method should be used. Every attempt should be made to clean the item before disposing as hazardous waste to reduce cost and waste.

iii. Porous items such as canvas tents or other fabrics may be laundered at companies, which specialize in industrial laundry services. Office partitions and carpeting present during firing should be considered grossly contaminated and disposed of as hazardous waste. Consult the Environmental office before removing and disposing of items.

6. **Medical Surveillance.**

i. A preplacement medical examination is required for all individuals involved with range cleanup operations.

7. **Air Monitoring.**

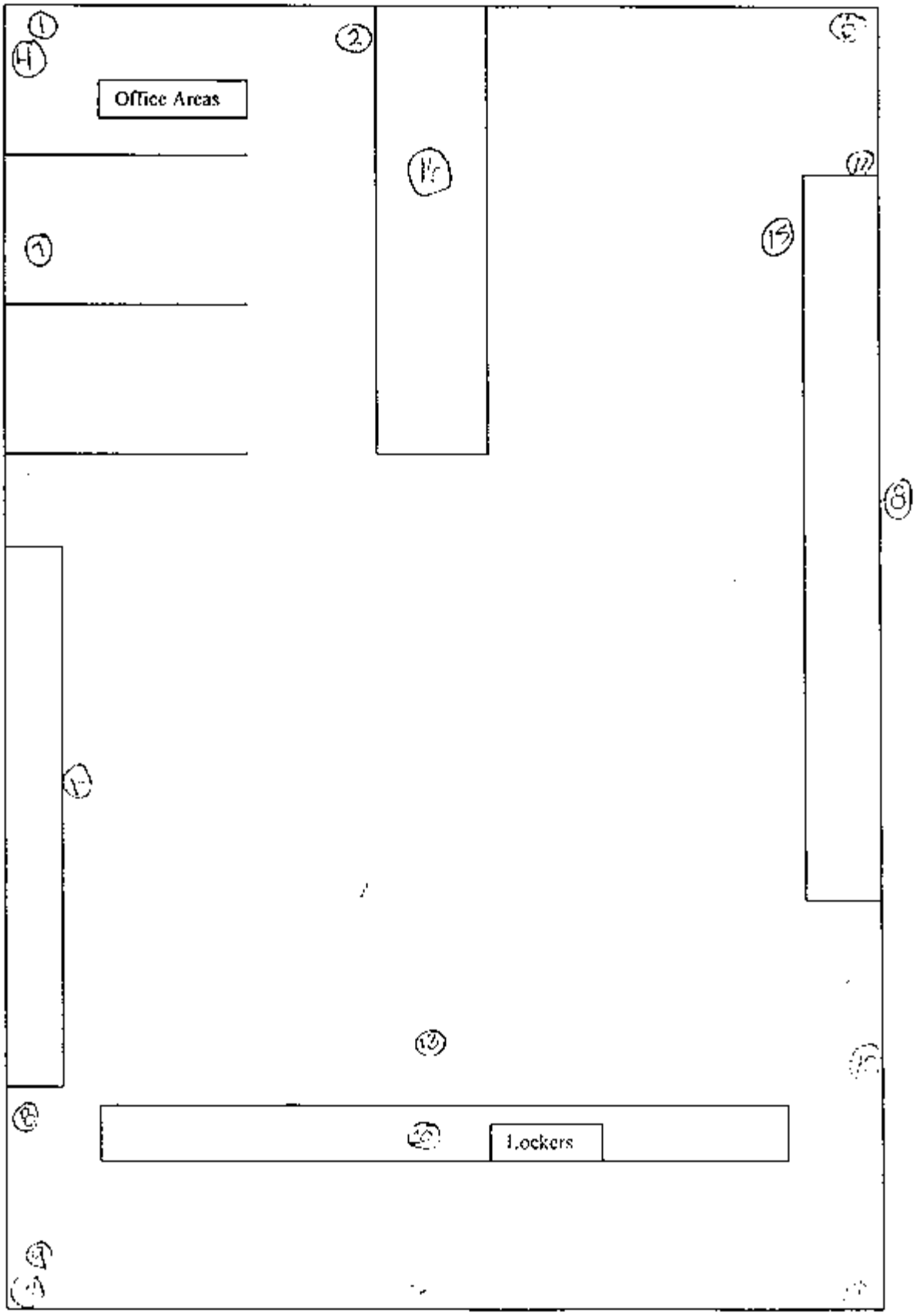
i. Worker breathing zone air samples must be collected during range cleanup to ensure that workers are not overexposed and to evaluate clean up procedures.

8. **Hazard Training**

i. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level of for whom the possibility of skin or eye irritation exists. This training should be provided for all personnel currently involved in rang cleanup operations at least annually.

APPENDIX D

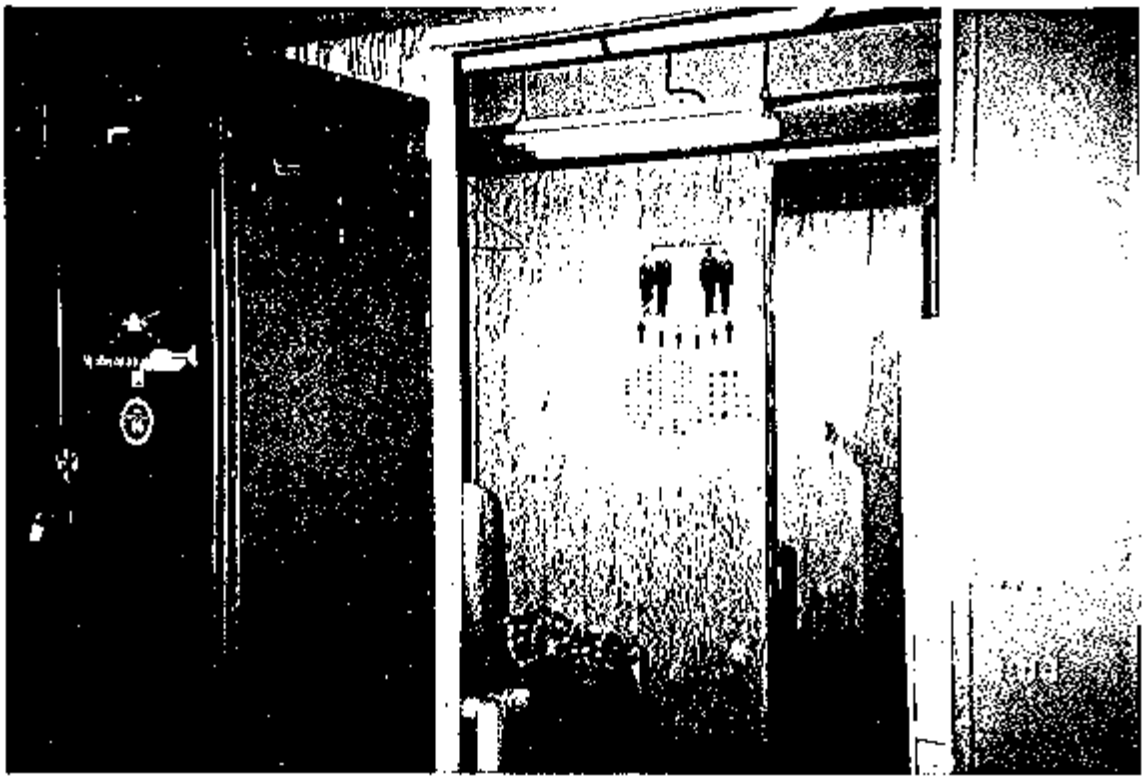
Ludlow Indoor Firing Range



Environmental Management Solutions

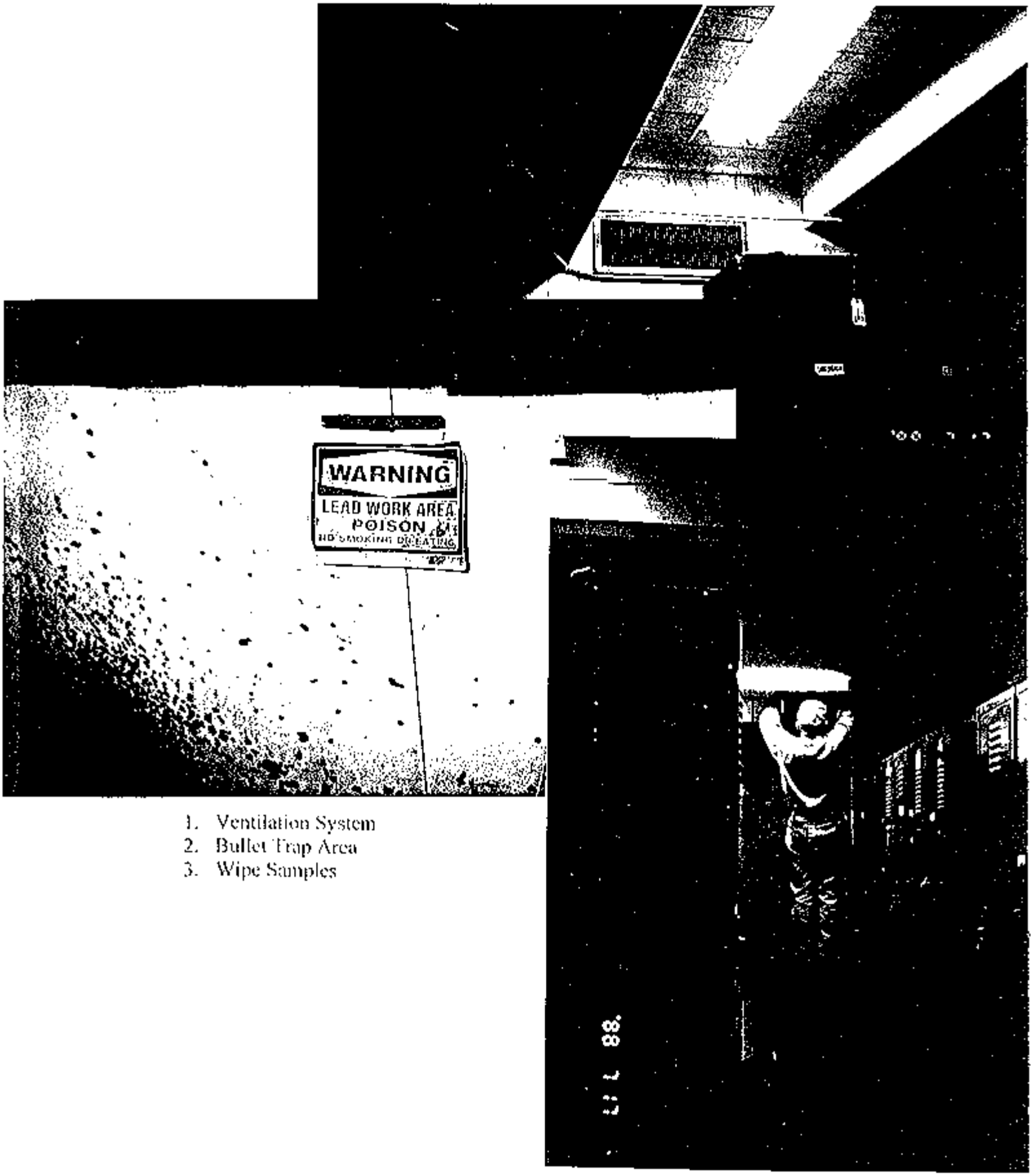
Ludlow Indoor Firing Range

Office Area



Lockers and other storage items downrange.

Ludlow Indoor Firing Range



1. Ventilation System
2. Bullet Trap Area
3. Wipe Samples

APPENDIX E

Sample Number	Location	Micrograms/Sample	Micrograms/Square Foot	Within Allowable Limits?
LW-01	Back wall, left side 8'	<3	<27	Y
LW-02	Back wall, middle 5'	<3	<27	Y
LW-03	Back wall, right side 1'	4.3	38.7	Y
LW-04	Floor, corner left side	11	99	Y
LW-05	Floor, corner backstop	Destroyed during analysis	NA	NA
LW-06	Floor, middle, center of room	45	405	N
LW-07	Left wall, second office	<3	<27	Y
LW-08	Left wall, middle 5'	<3	<27	Y
LW-09	Left wall, 1'	240	2160	N
LW-10	Right wall near backstop 10'	71	639	N
LW-11	Right wall, middle 5'	<3	<27	Y
LW-12	Right wall bottom 1'	6.3	56.7	Y
LW-13	Ceiling, middle, by backstop	58	522	N
LW-14	Ceiling, light fixture, left, middle of room	7.1	63.9	Y
LW-15	Ceiling, baffle, right side near door	27	243	N
LW-16	2nd storage locker 1st office	56	504	N
LW-17	Back top, right side 8'	69	621	N
LW-18	Back stop, middle, 4'	400	3600	N
LW-19	Backstop, left side (facing) 2'	380	3420	N
LW-20	Top of locker, near backstop	37	333	N
LW-21	Blank	<3	<27	N
LW-22	Blank	<3	<27	N

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Ludlow Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms. Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Lyndonville Armory
Indoor Firing Range

PO BOX 6891, DOUGLASVILLE, GEORGIA 30154
PHONE: 678.596.8509 • FAX: 770.234.6297

Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
The Lydonville indoor firing range is listed as active, however this area is used as storage space.	An official decision as to the status of this range should be immediately determined. If the range is to remain active, it must meet requirements set forth in NGR 385-15. If the range is to be converted, it must be adequately cleaned and decontaminated before employee use can resume.	RAC 2
Ten out of twenty wipe sample results were above the maximum allowable limit of 200 micrograms per square foot. It is unclear what type of protocol janitors cleaning this range used.	If the range is to be converted, it must be cleaned in accordance with National Guard Regulations before employee use can resume.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Lydonville Indoor Firing Range Survey performed 18 October 2000 at Lydonville Armory, VT.

BACKGROUND:

Introduction. At the request of Ms. Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Lydonville Indoor Firing Range at the Lydonville Armory in Vermont. Non-Responsive Non-Responsive contract industrial hygienist, Ms. Non-Responsive and Mr. Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 18 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Lydonville Indoor Firing Range is currently listed as an active range but is being used as a storage area for lockers, computer equipment, and other materials. The target retrieval system, sand trap, and bullet stop are all still in place.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. The range was evaluated using the wipe sampling protocol used in the National Guard Pamphlet 385-16, which addresses Indoor Firing Range conversion to other uses. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited. Lead deposits resulting from firing activities can build up in a firing range over time and must be adequately cleaned and sealed before the range is used for other purposes. If the range is not properly cleaned, the potential for exposure to employees who use the converted area remains.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Ten out of twenty wipe samples taken inside the range exceeded the limit of 200 micrograms per square foot. It is unknown, what type of protocol was used by janitors cleaning this range and it is apparent that lead contamination still exists. Light fixtures, walls, and beams, as well as a wipe sample taken in the office are show high levels of contamination. The range is still listed as active, but has been converted to a storage area. If the range is to remain active, then all stored items must be removed and the range cannot be used for any other purpose than as a firing range. If the range will be officially closed and converted, the indoor firing range should be cleaned so that it is as free of lead dust as possible before the area is used for other purposes to include storage. The following protocol should be used to clean the range and decontaminate items currently stored inside.

Recommendations

1. Post signs restricting personnel from the range until it has been appropriately cleaned. **(RAC 2)**
2. No stored items should be handled or used until they have been thoroughly decontaminated. **(RAC 2)**
3. No eating, drinking, or use of tobacco products should occur in the area. [29 CFR 1910.1025 (i)(1)] **(RAC 2)**
4. Decide whether the range will be used for range activities (i.e. weapons qualification and firing) or if it would be better suited for storage and office space. The indoor firing range should not be used for both activities. [NGR 385-15, NG PAM 385-16] **(RAC 2)**

    a. If the range is to remain active, the range cannot be used for any purpose other than firing. No equipment or furniture can be stored or maintained in the range. The range must meet all requirements of the National Guard Regulation 385-15 regarding Indoor Firing Ranges. Contact the Regional Industrial Hygiene Office regarding requirements. [NGR 385-15 1-18a, 1-17d] **(RAC 2)**
    b. If the range is to be used as a storage area and office space, it must be thoroughly decontaminated, reevaluated, and approved prior to its use. Follow all described procedures for cleaning and decontamination of the range and all stored items found in Appendix C. **Contact the Regional Industrial Hygiene Office for approval and reevaluation prior to and after cleaning. (RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

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TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Rite Aid Towelettes with Benzalkonium Chloride 1:750, 5% Denatured Alcohol
4" X 4" Template

Methodology.

A. *Wipe Samples.* Wipe samples were taken utilizing the protocol as set forth by NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. Details of locations where wipe samples were taken can be found in Appendix D.

Assessment Criteria.

A. Wipe Samples. Wipe sample results were compared with Ventilation rates were compared with the NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. See previous page for Reference information.

B. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

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

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

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

APPENDIX C

Decontamination and Cleaning Protocol

1. Ensure that all procedures listed below comply all federal, state, and local regulations. Consult the Regional Industrial Hygiene Office and State Environmental Office for further guidance.

2. **Ventilation System**
   i. The range ventilation system must be in operation during all cleaning activities. If no ventilation system is available all doors and windows must be kept sealed to prevent contamination of other areas.

3. **Materials**
   i. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup. If a HEPA vacuum cannot be obtained a wet method, detailed below, should be utilized. **A high-pressure water system or dry sweeping may not be used.**
   ii. A cleaning solution containing detergent and water is recommended. New solutions of detergent and water should be mixed frequently.
   iii. Two containers should be used; one for wetting the applicator (rags, sponge, mop) and the other for rinsing once the dust has been wiped from the surfaces.
   iv. Wastewater in containers can be left to evaporate. Any waste left in the buckets and applicators should be disposed of as hazardous waste. Consult the Environmental Office for appropriate disposal instructions.
   v. Personnel responsible for decontamination of the range and stored items should be provided with a full face air purifying respirator with a N100 filter or HEPA filter cartridge providing that all requirements for placing employees in respiratory protection have been met as detailed in 29 CFR 1910.134. Employees should be provided with protective coveralls with hood and shoe covers (i.e. Tyvek™ full body suit). Protective clothing should be hanged daily at the end of the shift and more frequently if the suit becomes grossly contaminated. If cotton coveralls are provided then the employer must provide for maintenance and laundering of protective clothing. Protective clothing should not be taken home and prior to leaving the work area, personnel should thoroughly HEPA vacuum clothing to prevent lead dust from leaving the area. Work and street clothing should not be stored together.

4. **Order of Cleaning**
   i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. All surface areas in the range must be cleaned. Stored items must be decontaminated prior to removal.
   ii. After removing the sand and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plates should be cleaned.
   iii. The ceiling, lights, baffles, retrieval system, heating systems, and ventilation ducts should be cleaned.
   iv. Acoustical material should be vacuumed instead of being painted over, A Toxic Characteristic Leaching Procedure (TCLP) may need to be used for

acoustical material and the like to determine if the material need to be classified as hazardous and disposed of accordingly. The Environmental Office should be contacted regarding this testing.

v. The floor should be the last surface cleaned starting at the bullet trap and ending behind the firing line. Concrete floors should be sealed with deck enamel and linoleum on tile floors should be waxed.

vi. All walls should be painted, preferably with a sealant, that will help prevent leaching of lead after covering.

vii. Following the wet cleaning of the area and after all surfaces have been allowed to dry thoroughly, a HEPA vacuum should be used on all surfaces, until no dust or residue can be seen. A through inspection to detect surface dust should be made following cleanup.

viii. The Regional Industrial Hygiene Office should be contacted for clearance sampling and to approve the range for converted use.

5. **Decontamination of stored items.**

i. All stored items must be decontaminated before removing them from the range. Stored equipment next to the bullet trap and firing line should be decontaminated first.

ii. A HEPA vacuum or wet cleaning method should be used. Every attempt should be made to clean the item before disposing as hazardous waste to reduce cost and waste.

iii. Porous items such as canvas tents or other fabrics may be laundered at companies, which specialize in industrial laundry services. Office partitions and carpeting present during firing should be considered grossly contaminated and disposed of as hazardous waste. Consult the Environmental office before removing and disposing of items.

6. **Medical Surveillance.**

i. A preplacement medical examination is required for all individuals involved with range cleanup operations.

7. **Air Monitoring.**

i. Worker breathing zone air samples must be collected during range cleanup to ensure that workers are not overexposed and to evaluate clean up procedures.

8. **Hazard Training**

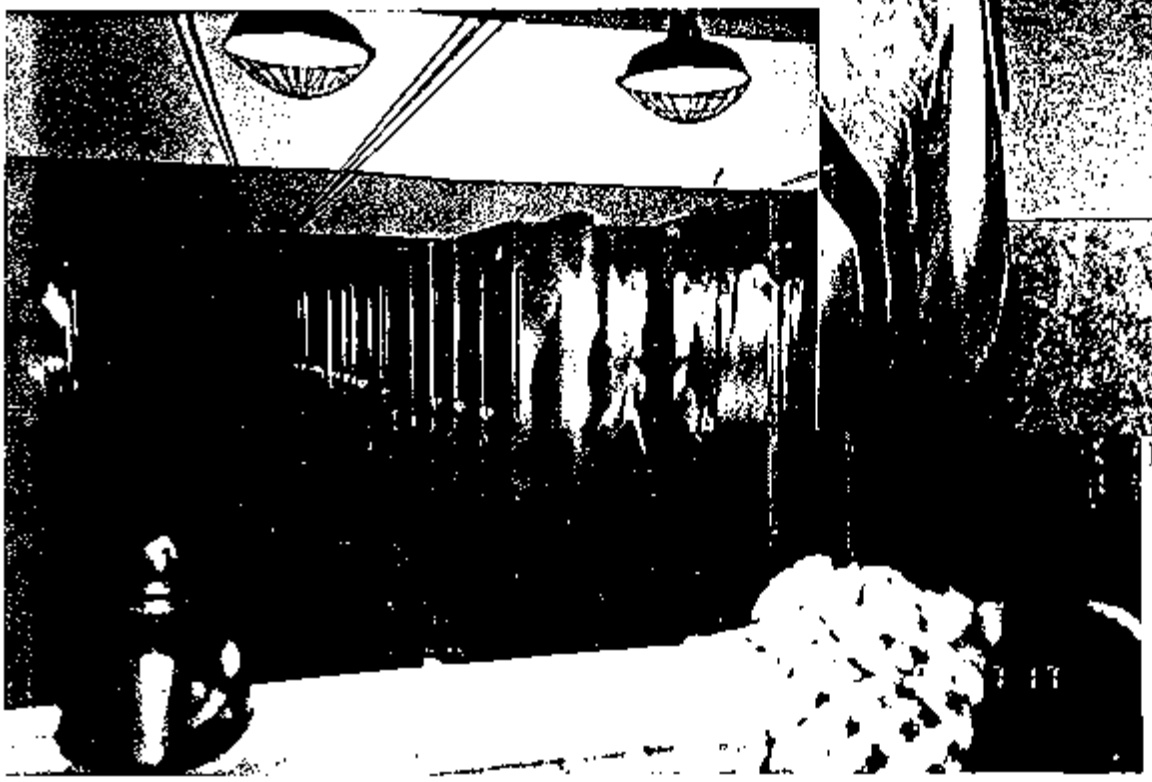
i. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level of for whom the possibility of skin or eye irritation exists. This training should be provided for all personnel currently involved in rang cleanup operations at least annually.

APPENDIX D

Lyndonville Indoor Firing Range

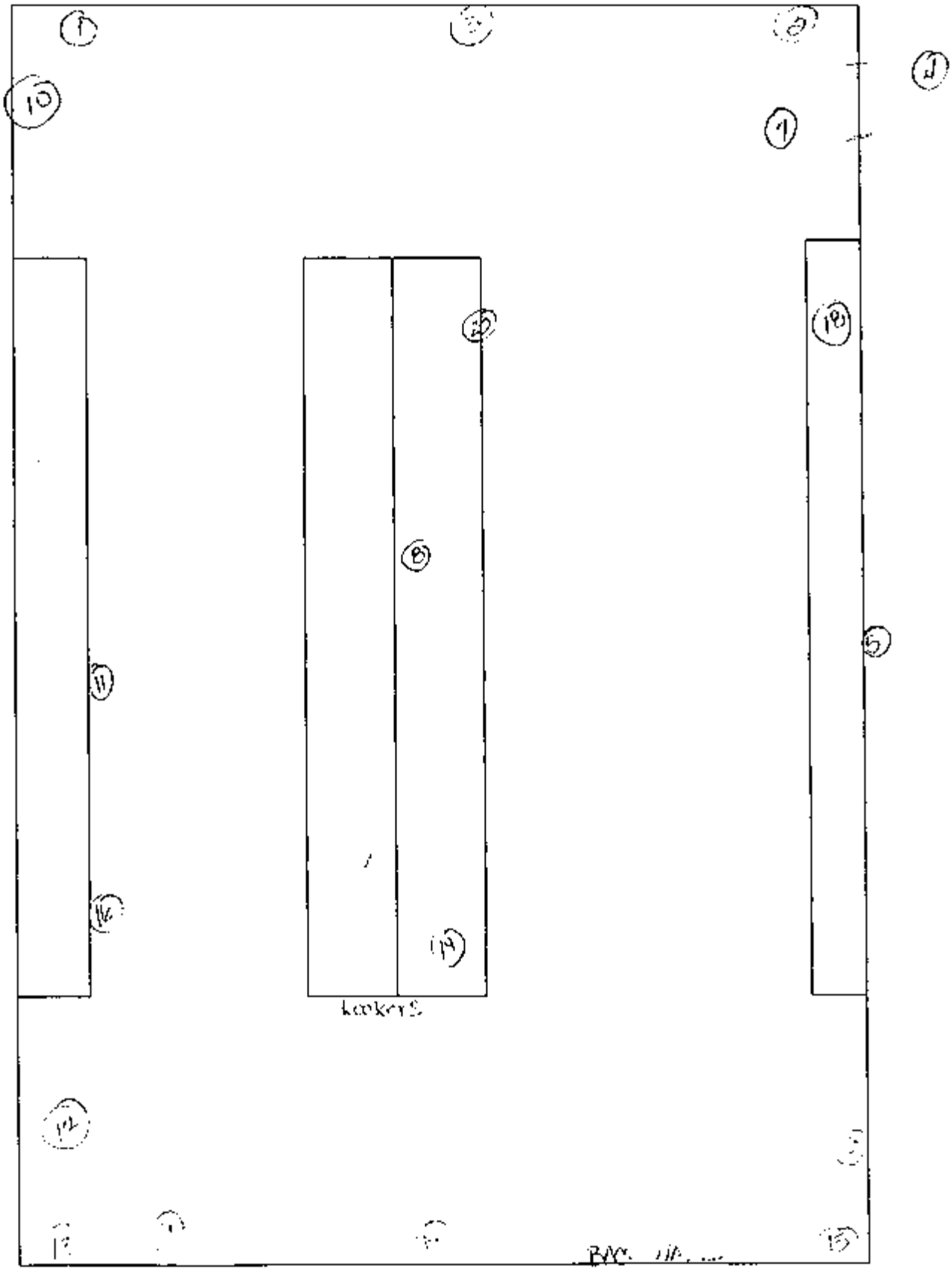
Stored items behind the firing line

Bullet Trap



Lockers downrange

Lyndonville Indoor Firing Range



Environmental Management Solutions

APPENDIX E

Sample Number	Location	Micrograms/Sample	Micrograms/Square Foot	Within Allowable Limits?
LY-01	Back wall, left corner 8'	4.5	40.5	Y
LY-02	Back wall, right corner, 1'	<3	<27	Y
LY-03	Back wall, middle 5' from floor, 4' from right wall	<3	<27	Y
LY-04	Right wall, 5' from floor toward, 10' from back wall	<3	<27	Y
LY-05	Right wall, 5' from floor between 1st and 2nd baffle	<3	<27	Y
LY-06	Right wall, 18" from floor	320	2880	N
LY-07	Ceiling, 18" from left wall, 3' from back wall	<3	<27	Y
LY-08	Ceiling, middle, 2nd baffle	19	171	Y
LY-09	Ceiling, 1st light from left wall	1800	16200	N
LY-10	Left wall, 5' from floor	<3	<27	Y
LY-11	Left wall, 1' from floor, between 2nd and 3rd baffles	<3	<27	Y
LY-12	Left wall, 8' from floor, near backstop	77	693	N
LY-13	Back stop, left corner, 1' from floor, 2' from left wall	4000	36000	N
LY-14	Back stop, middle 8' from floor	140	1260	N
LY-15	Back stop, right corner, 5' from floor	2700	24300	N
LY-16	Floor, left corner, 1' from wall, behind storage lockers	120	1080	N
LY-17	Floor, under 10th locker form front, 12' from wall	100	900	N
LY-18	Floor, just inside door, 1' from right wall	81	729	N
LY-19	Top of locker, toward back stop	48	432	N
LY-20	Right side of locker toward back of wall	7.9	71.1	Y
LY-21	Blank	<3	<27	Y

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Lyndonville Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

BEST AVAILABLE COPY

ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Morrisville Armory
Indoor Firing Range

PO BOX 6893, DOUGLASVILLE, GEORGIA 30154
PHONE: 678.596.8509 • FAX: 770.234.6297

Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
The Morrisville indoor firing range has not been fired on for nine years. The ventilation system, target retrieval system, and firing lanes are still present. The room is currently used for storage to include open boxes and food service equipment.	An official decision as to the status of this range should be immediately determined. If the range is to remain active, it must meet requirements set forth in NGR 385-15. If the range is to be converted, it must be adequately cleaned and decontaminated before employee use can resume.	RAC 2
Nine out of twenty-two wipe sample results were above the maximum allowable limit of 200 micrograms per square foot. It is unclear what type of protocol janitors cleaning this range used.	If the range is to be converted, it must be cleaned in accordance with National Guard Regulations before employee use can resume.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Morrisville Indoor Firing Range Survey performed 19 October 2000 at Morrisville Armory, VT.

BACKGROUND:

Introduction. At the request of Ms. Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Morrisville Indoor Firing Range at the Morrisville Armory in Vermont. Ms. Non-Responsive Non-Responsive contract industrial hygienist, Ms. Non-Responsive and Mr Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 19 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Morrisville Indoor Firing Range has not been officially used for approximately nine years. It was last cleaned approximately two years ago and painting occurred before the range was cleaned. The floor has not been sealed. The ventilation system, target retrieval, system, and firing lanes are still present in the range. The area is currently used as a storage area with open boxes and food serving equipment inside. The range has not officially been closed and is still listed as an active range.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. The range was evaluated using the wipe sampling protocol used in the National Guard Pamphlet 385-16, which addresses Indoor Firing Range conversion to other uses. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited. Lead deposits resulting from firing activities can build up in a firing range over time and must be adequately cleaned and sealed before the range is used for other purposes. If the range is not properly cleaned, the potential for exposure to employees who use the converted area remains.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Nine out of twenty-two wipe samples taken inside the range exceeded the limit of 200 micrograms per square foot. It is unknown, what type of protocol was used by janitors cleaning this range and it is apparent that lead contamination still exists. Areas near the backstop and a table stored in the range show high levels of contamination. The range is listed as active but is used for storage of boxes and food service equipment. If the range is to remain active, then all stored items must be removed and the range cannot be used for any other purpose than as a firing range. If the range will be officially closed and converted, the indoor firing range should be cleaned so that it is as free of lead dust as possible before the area is used for other purposes to include office space and storage. The following protocol should be used to clean the range and decontaminate items currently stored inside.

Recommendations

1. Post signs restricting personnel from the range until it has been appropriately cleaned. **(RAC 2)**
2. No stored items should be handled or used until they have been thoroughly decontaminated. **(RAC 2)**
3. No eating, drinking, or use of tobacco products should occur in the area. [29 CFR 1910.1025 (i)(1)] **(RAC 2)**
4. Decide whether the range will be used for range activities (i.e. weapons qualification and firing) or if it would be better suited for storage and office space. The indoor firing range should not be used for both activities. [NGR 385-15, NG PAM 385-16] **(RAC 2)**

    a. If the range is to remain active, the range cannot be used for any purpose other than firing. No equipment or furniture can be stored or maintained in the range. The range must meet all requirements of the National Guard Regulation 385-15 regarding Indoor Firing Ranges. Contact the Regional Industrial Hygiene Office regarding requirements. [NGR 385-15 1-18a, 1-17d] **(RAC 2)**
    b. If the range is to be used as a storage area and office space, it must be thoroughly decontaminated, reevaluated, and approved prior to its use. Follow all described procedures for cleaning and decontamination of the range and all stored items found in Appendix C. **Contact the Regional Industrial Hygiene Office for approval and reevaluation prior to and after cleaning. (RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Rite Aid Towelettes with Benzalkonium Chloride 1:750, 5% Denatured Alcohol
4" X 4" Template

Methodology.

A. *Wipe Samples.* Wipe samples were taken utilizing the protocol as set forth by NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. Details of locations where wipe samples were taken can be found in Appendix D.

Assessment Criteria.

A. Wipe Samples. Wipe sample results were compared with Ventilation rates were compared with the NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. See previous page for Reference information.

B. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX D

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

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

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

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

APPENDIX C

Decontamination and Cleaning Protocol

1. Ensure that all procedures listed below comply all federal, state, and local regulations. Consult the Regional Industrial Hygiene Office and State Environmental Office for further guidance.

2. **Ventilation System**
   i. The range ventilation system must be in operation during all cleaning activities. If no ventilation system is available all doors and windows must be kept sealed to prevent contamination of other areas.

3. **Materials**
   i. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup. If a HEPA vacuum cannot be obtained a wet method, detailed below, should be utilized. **A high-pressure water system or dry sweeping may not be used.**
   ii. A cleaning solution containing detergent and water is recommended. New solutions of detergent and water should be mixed frequently.
   iii. Two containers should be used; one for wetting the applicator (rags, sponge, mop) and the other for rinsing once the dust has been wiped from the surfaces.
   iv. Wastewater in containers can be left to evaporate. Any waste left in the buckets and applicators should be disposed of as hazardous waste. Consult the Environmental Office for appropriate disposal instructions.
   v. Personnel responsible for decontamination of the range and stored items should be provided with a full face air purifying respirator with a N100 filter or HEPA filter cartridge providing that all requirements for placing employees in respiratory protection have been met as detailed in 29 CFR 1910.134. Employees should be provided with protective coveralls with hood and shoe covers (i.e. Tyvek™ full body suit). Protective clothing should be hanged daily at the end of the shift and more frequently if the suit becomes grossly contaminated. If cotton coveralls are provided then the employer must provide for maintenance and laundering of protective clothing. Protective clothing should not be taken home and prior to leaving the work area, personnel should thoroughly HEPA vacuum clothing to prevent lead dust from leaving the area. Work and street clothing should not be stored together.

4. **Order of Cleaning**
   i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. All surface areas in the range must be cleaned. Stored items must be decontaminated prior to removal.
   ii. After removing the sand and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plates should be cleaned.
   iii. The ceiling, lights, baffles, retrieval system, heating systems, and ventilation ducts should be cleaned.
   iv. Acoustical material should be vacuumed instead of being painted over, A Toxic Characteristic Leaching Procedure (TCLP) may need to be used for

acoustical material and the like to determine if the material need to be classified as hazardous and disposed of accordingly. The Environmental Office should be contacted regarding this testing.

v. The floor should be the last surface cleaned starting at the bullet trap and ending behind the firing line. Concrete floors should be sealed with deck enamel and linoleum on tile floors should be waxed.

vi. All walls should be painted, preferably with a sealant, that will help prevent leaching of lead after covering.

vii. Following the wet cleaning of the area and after all surfaces have been allowed to dry thoroughly, a HEPA vacuum should be used on all surfaces, until no dust or residue can be seen. A through inspection to detect surface dust should be made following cleanup.

viii. The Regional Industrial Hygiene Office should be contacted for clearance sampling and to approve the range for converted use.

5. **Decontamination of stored items.**

i. All stored items must be decontaminated before removing them from the range. Stored equipment next to the bullet trap and firing line should be decontaminated first.

ii. A HEPA vacuum or wet cleaning method should be used. Every attempt should he made to clean the item before disposing as hazardous waste to reduce cost and waste.

iii. Porous items such as canvas tents or other fabrics may be laundered at companies, which specialize in industrial laundry services. Office partitions and carpeting present during firing should be considered grossly contaminated and disposed of as hazardous waste. Consult the Environmental office before removing and disposing of items.

6. **Medical Surveillance.**

i. A preplacement medical examination is required for all individuals involved with range cleanup operations.

7. **Air Monitoring.**

i. Worker breathing zone air samples must be collected during range cleanup to ensure that workers are not overexposed and to evaluate clean up procedures.

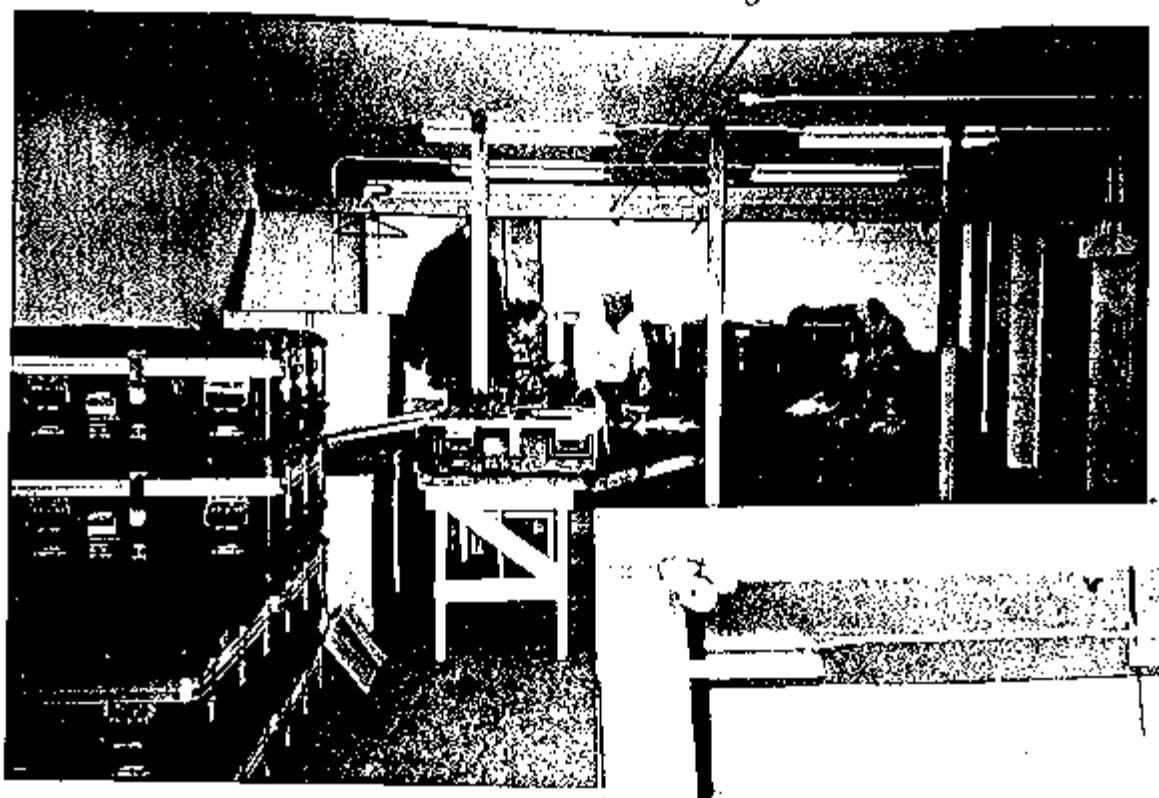
8. **Hazard Training**

i. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level of for whom the possibility of skin or eye irritation exists. This training should be provided for all personnel currently involved in rang cleanup operations at least annually.

APPENDIX D

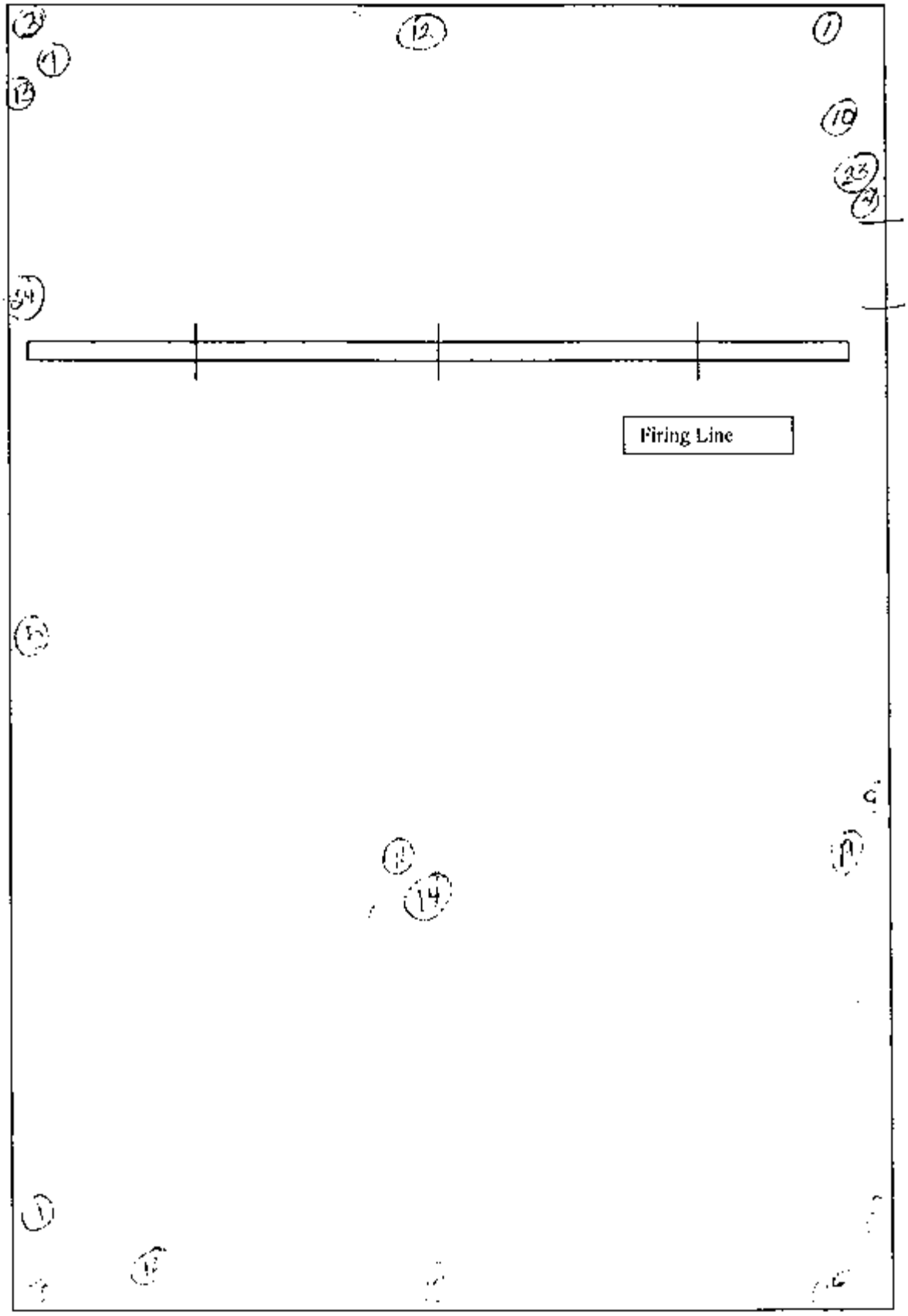
Morrisville Indoor Firing Range

Stored items behind the firing line.



Downrange.

Morrisville Indoor Firing Range



Environmental Management Solutions

APPENDIX E

Sample Number	Location	Micrograms/Sample	Micrograms/Square Foot	Within Allowable Limits?
MV-01	Back wall, 9', right corner	<3	<27	Y
MV-02	Back wall, 5', middle	<3	<27	Y
MV-03	Back wall, 1', left corner	<3	<27	Y
MV-04	Right wall, 1', just inside entrance to the left	<3	<27	Y
MV-05	Left wall, 5', middle of range	320	2880	N
MV-06	Right wall, 9', near back stop	<3	<27	Y
MV-07	Left wall, 9', left corner	<3	<27	Y
MV-08	Right wall, 5', middle of range	<3	<27	Y
MV-09	Left wall, 9', near backstop	<3	<27	Y
MV-10	Ceiling, right corner	<3	<27	Y
MV-11	Ceiling, 2nd baffle, middle of range	24	216	N
MV-12	Ceiling, left most light fixture	170	1530	N
MV-13	Floor, 1' from each wall, left corner	3.7	33.3	Y
MV-14	Floor, middle of room, between 2nd and 3rd baffle	180	1620	N
MV-15	Floor, right corner, near backstop	4000	36000	N
MV-16	Backstop, 8'	100	900	N
MV-17	Backstop, 5'	280	2520	N
MV-18	Backstop 3'	310	2790	N
MV-19	Right table middle of room	34	306	N
MV-20	BLANK	<3	<27	Y
MV-21	Left wall, 1' near backstop	3.9	35.1	Y
MV-22	BLANK	<3	<27	Y
MV-23	Outside of door, left, underneath locker	6.8	61.2	Y
MV-24	Food server, steam table, left of room	<3	<27	Y

ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

North Springfield Armory
Indoor Firing Range

PO BOX 6893, DOUGLASVILLE, GEORGIA 30154
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Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
The North Springfield indoor firing range has not been fired on for fifteen to twenty years. The range is listed as active, however offices have been put in this area as well as storage items to include lockers and other equipment.	An official decision as to the status of this range should be immediately determined. If the range is to remain active, it must meet requirements set forth in NGR 385-15. If the range is to be converted, it must be adequately cleaned and decontaminated before employee use can resume.	RAC 2
Four of the twenty-four wipe sample results were above the maximum allowable limit of 200 micrograms per square foot. It is unclear what type of protocol janitors cleaning this range used.	If the range is to be converted, it must be cleaned in accordance with National Guard Regulations before employee use can resume.	RAC 2

SUBJECT: Industrial Hygiene Survey of the North Springfield Indoor Firing Range Survey performed 17 October 2000 at North Springfield Armory, VT.

BACKGROUND:

Introduction. At the request of Ms. Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the North Springfield Armory in Vermont. Ms. Non-Responsive contract industrial hygienist, Ms. Non-Responsive and Mr. Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 17 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The North Springfield Indoor Firing Range was cleaned with clearance samples below 200 micrograms in late 1998 to early 1999. The range was painted, but personnel are unsure if the range was sealed after painting. The range has been used for a storage area for at least fifteen to twenty years. The ventilation system is present from the original range. The range has not officially been closed and is still listed as an active range.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. The range was evaluated using the wipe sampling protocol used in the National Guard Pamphlet 385-16, which addresses Indoor Firing Range conversion to other uses. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited. Lead deposits resulting from firing activities can build up in a firing range over time and must be adequately cleaned and sealed before the range is used for other purposes. If the range is not properly cleaned, the potential for exposure to employees who use the converted area remains.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Four out of the twenty-four wipe samples taken inside the range exceeded the limit of 200 micrograms per square foot. High levels were concentrated around the bullet trap still present in the range. It is unknown, what type of protocol was used by janitors cleaning this range, and it is apparent that some lead contamination still exists. The range is still listed as active, but is being used as storage space for lockers and other equipment. If the range is to remain active, then all stored items must be removed and the range cannot be used for any other purpose than as a firing range. If the range will be officially closed and converted, the indoor firing range should be cleaned so that it is as free of lead dust as possible before the area is used for other purposes to include office space and storage. The following protocol should be used to clean the range and decontaminate items currently stored inside.

Recommedations.

1. Post signs restricting personnel from the range until it has been appropriately cleaned. **(RAC 2)**
2. No stored items should be handled or used until they have been thoroughly decontaminated. **(RAC 2)**
3. No eating, drinking, or use of tobacco products should occur in the area. [29 CFR 1910.1025 (i)(1)] **(RAC 2)**
4. Decide whether the range will be used for range activities (i.e. weapons qualification and firing) or if it would be better suited for storage and office space. The indoor firing range should not be used for both activities. [NGR 385-15, NG PAM 385-16] **(RAC 2)**

    a. If the range is to remain active, the range cannot be used for any purpose other than firing. No equipment or furniture can be stored or maintained in the range. The range must meet all requirements of the National Guard Regulation 385-15 regarding Indoor Firing Ranges. Contact the Regional Industrial Hygiene Office regarding requirements. [NGR 385-15 1-18a, 1-17d] **(RAC 2)**
    b. If the range is to be used as a storage area and office space, it must be thoroughly decontaminated, reevaluated, and approved prior to its use. Follow all described procedures for cleaning and decontamination of the range and all stored items found in Appendix C. **Contact the Regional Industrial Hygiene Office for approval and reevaluation prior to and after cleaning. (RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Rite Aid Towelettes with Benzalkonium Chloride 1:750, 5% Denatured Alcohol
4" X 4" Template

Methodology.

A. *Wipe Samples.* Wipe samples were taken utilizing the protocol as set forth by NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. Details of locations where wipe samples were taken can be found in Appendix D.

Assessment Criteria.

A. Wipe Samples. Wipe sample results were compared with Ventilation rates were compared with the NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. See previous page for Reference information.

B. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

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

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

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

APPENDIX C

Decontamination and Cleaning Protocol

1. Ensure that all procedures listed below comply all federal, state, and local regulations. Consult the Regional Industrial Hygiene Office and State Environmental Office for further guidance.

2. **Ventilation System**
   i. The range ventilation system must be in operation during all cleaning activities. If no ventilation system is available all doors and windows must be kept sealed to prevent contamination of other areas.

3. **Materials**
   i. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup. If a HEPA vacuum cannot be obtained a wet method, detailed below, should be utilized. **A high-pressure water system or dry sweeping may not be used.**
   ii. A cleaning solution containing detergent and water is recommended. New solutions of detergent and water should be mixed frequently.
   iii. Two containers should be used; one for wetting the applicator (rags, sponge, mop) and the other for rinsing once the dust has been wiped from the surfaces.
   iv. Wastewater in containers can be left to evaporate. Any waste left in the buckets and applicators should be disposed of as hazardous waste. Consult the Environmental Office for appropriate disposal instructions.
   v. Personnel responsible for decontamination of the range and stored items should be provided with a full face air purifying respirator with a N100 filter or HEPA filter cartridge providing that all requirements for placing employees in respiratory protection have been met as detailed in 29 CFR 1910.134. Employees should be provided with protective coveralls with hood and shoe covers (i.e. Tyvek™ full body suit). Protective clothing should be hanged daily at the end of the shift and more frequently if the suit becomes grossly contaminated. If cotton coveralls are provided then the employer must provide for maintenance and laundering of protective clothing. Protective clothing should not be taken home and prior to leaving the work area, personnel should thoroughly HEPA vacuum clothing to prevent lead dust from leaving the area. Work and street clothing should not be stored together.

4. **Order of Cleaning**
   i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. All surface areas in the range must be cleaned. Stored items must be decontaminated prior to removal.
   ii. After removing the sand and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plates should be cleaned.
   iii. The ceiling, lights, baffles, retrieval system, heating systems, and ventilation ducts should be cleaned.
   iv. Acoustical material should be vacuumed instead of being painted over, A Toxic Characteristic Leaching Procedure (TCLP) may need to be used for

acoustical material and the like to determine if the material need to be classified as hazardous and disposed of accordingly. The Environmental Office should be contacted regarding this testing.

v. The floor should be the last surface cleaned starting at the bullet trap and ending behind the firing line. Concrete floors should be sealed with deck enamel and linoleum on tile floors should be waxed.

vi. All walls should be painted, preferably with a sealant, that will help prevent leaching of lead after covering.

vii. Following the wet cleaning of the area and after all surfaces have been allowed to dry thoroughly, a HEPA vacuum should be used on all surfaces, until no dust or residue can be seen. A through inspection to detect surface dust should be made following cleanup.

viii. The Regional Industrial Hygiene Office should be contacted for clearance sampling and to approve the range for converted use.

5. **Decontamination of stored items.**

i. All stored items must be decontaminated before removing them from the range. Stored equipment next to the bullet trap and firing line should be decontaminated first.

ii. A HEPA vacuum or wet cleaning method should be used. Every attempt should be made to clean the item before disposing as hazardous waste to reduce cost and waste.

iii. Porous items such as canvas tents or other fabrics may be laundered at companies, which specialize in industrial laundry services. Office partitions and carpeting present during firing should be considered grossly contaminated and disposed of as hazardous waste. Consult the Environmental office before removing and disposing of items.

6. **Medical Surveillance.**

i. A preplacement medical examination is required for all individuals involved with range cleanup operations.

7. **Air Monitoring.**

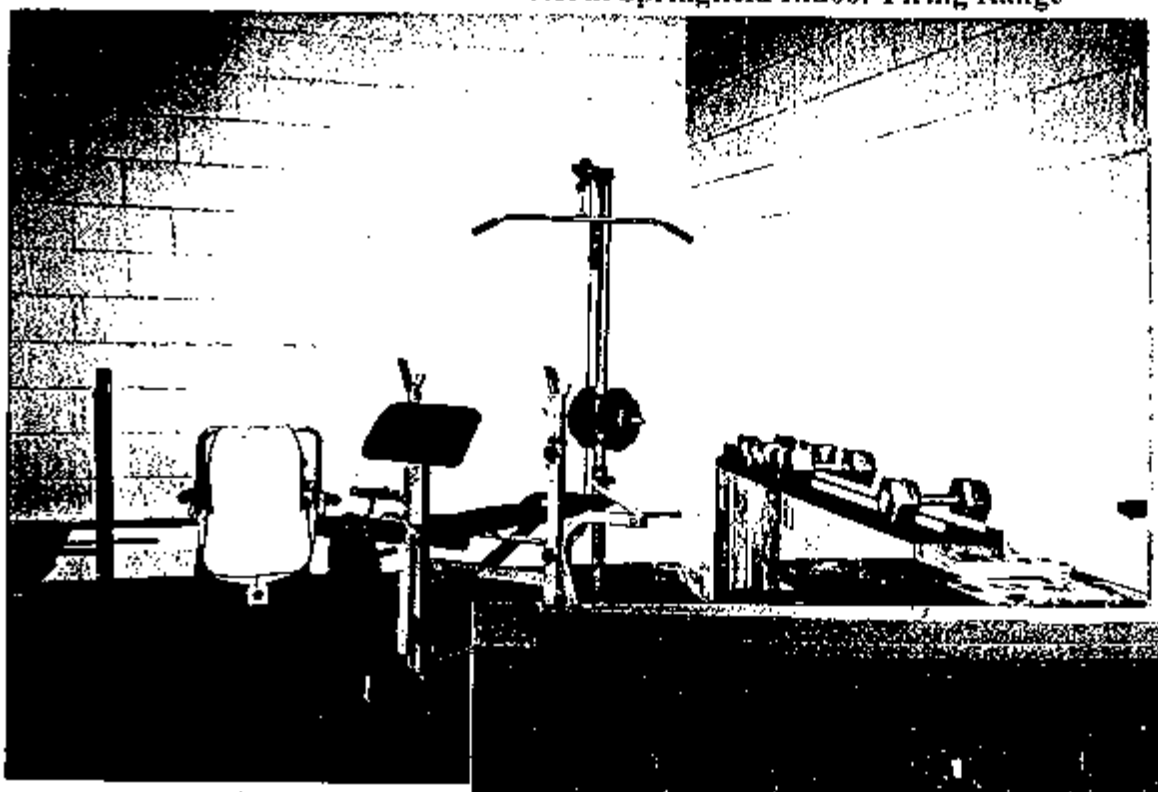
i. Worker breathing zone air samples must be collected during range cleanup to ensure that workers are not overexposed and to evaluate clean up procedures.

8. **Hazard Training**

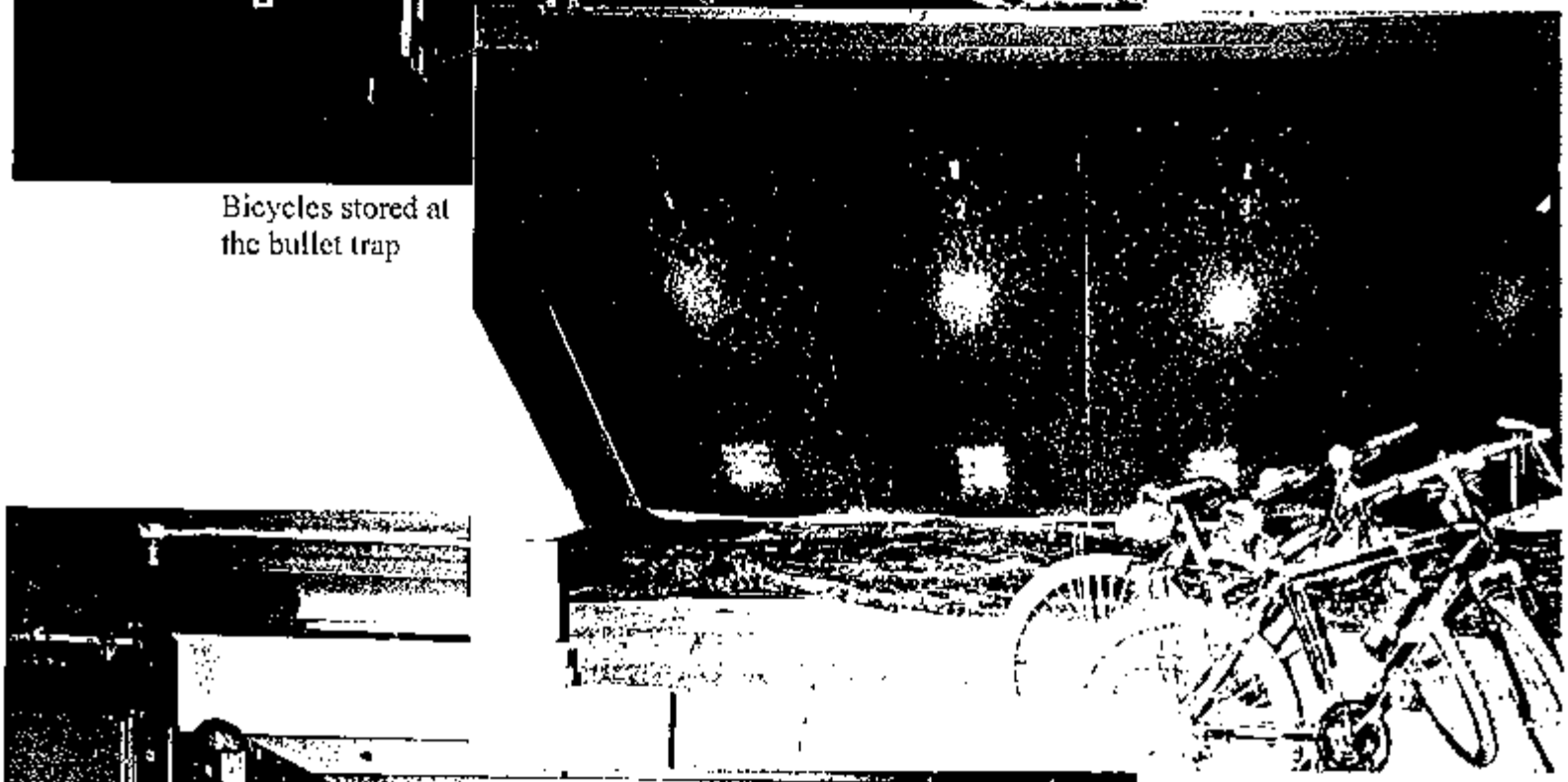
i. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level of for whom the possibility of skin or eye irritation exists. This training should be provided for all personnel currently involved in rang cleanup operations at least annually.

APPENDIX D

North Springfield Indoor Firing Range



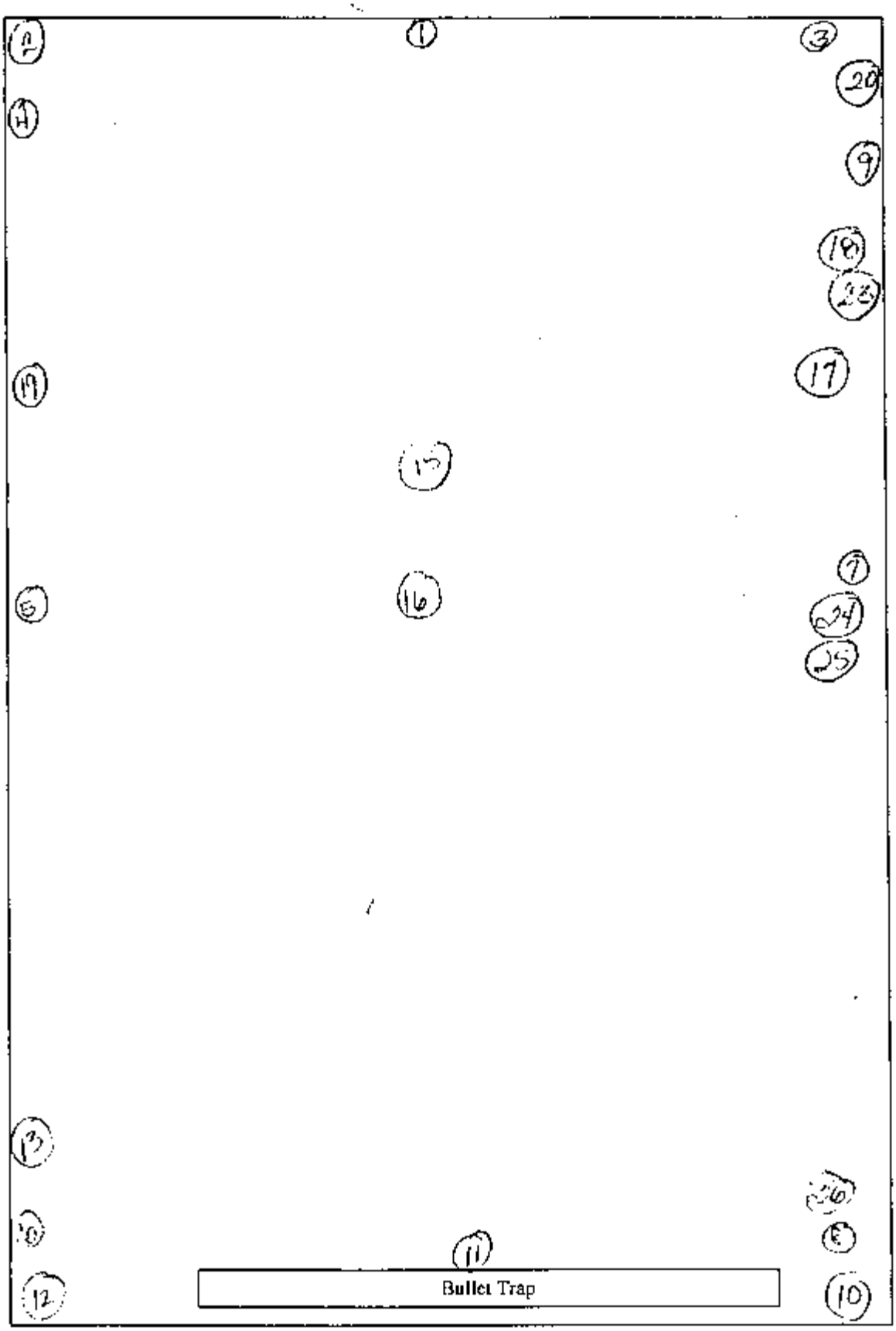
Weight Room behind the firing line



Bicycles stored at the bullet trap

Downrange

North Springfield Indoor Firing Range



Environmental Management Solutions

APPENDIX E

Sample Number	Location	Micrograms/Sample	Micrograms/ Square Foot	Within Allowable Limits?
NS-01	Back Wall 8' from floor	<3	<27	Y
NS-02	Back Wall 1' from floor	<3	<27	Y
NS-03	Back wall 5' from floor	<3	<27	Y
NS-04	Left Wall 2' from floor	<3	<27	Y
NS-05	Left Wall 8' from floor	<3	<27	Y
NS-06	Left Wall 6' from floor	<3	<27	Y
NS-07	Right Wall 5'	<3	<27	Y
NS-08	Right Wall 2'	<3	<27	Y
NS-09	Right Wall 8' from floor, above door	<3	<27	Y
NS-10	Bullet Stop 5'	30	270	N
NS-11	Bullet Stop 1'	800	7200	N
NS-12	Bullet Stop 8'	37	333	N
NS-13	Leftmost light fixture, first baffle	44	396	N
NS-14	Floor, 4' from left wall, under sand table	11	99	Y
NS-15	Fourth baffle, middle of room	13	117	Y
NS-16	Floor middle of room between 3rd and 4th baffle.	10	90	Y
NS-17	Light fixture, far right side, two feet from right wall	10	90	Y
NS-18	Floor 6" from right wall, just inside door	7.3	65.7	Y
NS-19	Top if lockers, fourth locker, right side	6.4	57.6	Y
NS-20	Drill floor, left side of door (exiting) outside	3.5	31.5	Y
NS-21	Blank	<3	<27	Y
NS-22	Blank	<3	<27	Y
NS-23	Drill floor, center	<3	<27	Y
NS-24	Far wall drill floor outside of classroom door	<3	<27	Y
NS-25	Far wall, drill floor outside of classroom door	<3	<27	Y
NS-26	Outside of and in front of second range access door	3.1	27.9	Y

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 17 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at North Springfield Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms. Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

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Industrial Hygiene Survey Report

Vermont Army National Guard

Rutland Armory Indoor Firing Range
P.O. Box 788
Rutland, VT 05701

Prepared by:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

10 August 1999

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Table of Contents

Appendices

I. Executive Summary

Ms [redacted] Regional Industrial Hygienist, performed an indoor firing range (IFR) survey at the Rutland Armory on 13 January 1999. The survey was scheduled in accordance with NGR 385-15 (reference 3) which requires biennial inspections of all active indoor firing ranges. The range was recently cleaned as part of a periodic cleaning program. It had been used for firing during the weekend prior to the survey, which was the only time it was used since the cleaning was performed.

The make-up air for the range was disconnected at the time of the survey. This caused the air to be circulated around the firing line through a forced air heater hanging from the ceiling. The lack of make-up air causes the range to be unsafe for firing because lead dust is carried directly into the breathing zone of the firers. In addition, the area behind the firing line is contaminated allowing lead dust to be carried out of the range on the firers' clothes and shoes. Once the recommendations in this report are completed, the range should be reevaluated to ensure it is safe for firing. This evaluation should include ventilation measurements to check for the minimum airflow of 50 feet per minute (fpm) across the firing line and air sampling for lead during firing.

II. Table of Findings and Recommendations

Location		
Findings	**Recommendations**	**RAC**
Ventilation		
The smoke test demonstrated that the airflow in the range is not laminar and that during firing, lead dust is most likely carried back through the firers' breathing zone and behind the firing line.	Reconnect the make-up air system and ensure that the firing range is not used unless the system is functioning properly.	**RAC 2**
	This range should not be used for firing until the ventilation system is corrected and this office has evaluated the range.	**No RAC Assigned.**
The supply and exhaust ventilation systems were not interlocked.	Ensure the make-up and exhaust systems are interlocked to prevent the use of one without the other.	**RAC 2**
The only make-up air was coming from a hot water heater system with forced air, which was located behind the firing line on the end furthest from the door.	Remove the small forced-air heater from the range. Check with the VT Environmental Office to see if the heater must be disposed of as hazardous waste.	**RAC 3**
Lead Tests		
The lead test kits gave immediate and strong positive results for lead in the following areas. - on the door knob on the inside of the range door - on the plenum wall - floor outside of the range - front louver of the space heater	Completely clean the area behind the firing line, including the plenum wall, prior to reopening the range.	**RAC 3**
	Ensure a HEPA vacuum or wet method of cleaning is used to clean the firing line and the area behind the firing line after each day of firing.	**RAC 3**
Other		
The entrance door to the range is not sealed.	Install weather stripping on the entrance door to the range.	**RAC 4**
At the time of the survey, a broom was being stored in the range	Stop the practice of dry sweeping the range.	**RAC 3**
Some ceiling tiles were missing from the ceiling in the range as well as in the storage closet off of the range.	Replace the missing ceiling tiles in the range and in the storage closet off of the range.	**No RAC Assigned**
There was some concern about the sump-pump located in the range.	Request that the VTARNG Environmental Office evaluate the potential for release of lead dust through the sump-pump in the event of excess water in the range.	**No RAC Assigned**

III. Report

A. Introduction

1) Ms [redacted] Regional Industrial Hygienist, performed an industrial hygiene survey of the IFR at the Rutland Armory on 13 January 1999. The survey was scheduled in accordance with NGR 385-15 (reference 3) which requires biennial inspections of all active indoor firing ranges.

2) Advanced Abatement Technologies, Inc (AAT) cleaned the Rutland Armory IFR in December 1998. This was a routine cleaning of all surfaces, excluding the bullet trap, which MAJ [redacted] of the VTARNG Environmental Office arranged for all IFRs in the state of Vermont. The cleaning process was scheduled as periodic cleaning and was not accomplished to convert the IFRs to any other use.

3) The firing range was used during the weekend prior to this survey. That was the first time the firing range was fired on after it was cleaned by AAT.

B. Scope of Work

Smoke candles were used in to visualize the airflow in the range. In addition, a lead test kit was used to test for any evidence of lead in the range.

C. Health Effects of Lead

Lead is a cumulative poison that collects in the blood, bones and organs of the body such as the kidneys, brain and liver. Prolonged absorption of lead can result in severe gastrointestinal disturbances and anemia, with more serious intoxication leading to neuromuscular dysfunction. Lead can remain in the bones for decades and may be introduced into other parts of the body at a later date given the right circumstances. In indoor firing ranges, lead can enter the body by inhalation (breathing) and ingestion (by not washing hands before eating, drinking, smoking, or applying make-up or lip balm). Since children are particularly susceptible to lead's toxic effects, children and pregnant females should not be allowed to enter lead-contaminated areas such as indoor firing ranges. Soldiers, especially those with small children, should be aware of the potential for lead dust to be carried home on their clothing.

D. Methodology and Assessment Criteria

1) Evaluation criteria are the most stringent of those found in NGR 385-15, Policy, Responsibilities and Procedures for Inspection/Evaluation and Use of ARNG Indoor Firing Ranges, 30 March 1990.

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

E. Findings and Discussion

1) Smoke Test and Ventilation.

a) The smoke test demonstrated that the airflow in the range is not laminar and that during firing, lead dust is most likely carried back through the firers' breathing zone and behind the firing line. This is not in accordance with the guidelines of NGR 385-15, which states that the airflow should be uniform from wall to wall and floor to ceiling moving downrange, with an average minimum airflow at the firing line of 50 feet per minute (fpm). This means that there shouldn't be turbulence in the range and that all of the air should be exhausted downrange. Unfortunately, in this range, the air seemed to circle around the firing line with none of the air being exhausted downrange. See Appendix C for a diagram of the range with airflow patterns.

b) Once this problem was identified, it was determined that the actual make-up air was disconnected because there was not any propane for the system that heats the air. The only make-up air was coming from a hot water heater system with forced air, which was located behind the firing line on the end furthest from the door. Given the lack of make-up air, this system was simply circulating the air in the range and contaminating the area behind the firing line with lead dust. The range should never be used if the make-up air system is not functioning properly, because the firers' are not protected from lead dust. Range personnel stated that the system had been operating this way for 2 or more years.

c) The exhaust air above the bullet trap was working and was connected with the downrange lighting as recommended. However, the supply and exhaust ventilation systems were obviously not interlocked as required. This is meant to prevent soldiers' from firing with only one ventilation system in use. In addition, the exhaust air should exceed the make-up air to provide a slightly negative pressure in relation to adjacent areas. This is to prevent lead dust from exiting the range and entering other areas. Since the make-up air was disconnected, we were

unable to measure the static pressure of the range to make sure it was under negative pressure.

2) Lead Tests.

a) As part of this survey, we conducted qualitative tests for lead dust using Lead Check Swabs®. Although this test does not quantify the amount of lead dust present, the speed of reaction and the darkness of the color expressed, give a good indication of the level of lead contamination. The lead test kits gave immediate and strong positive results for lead in the following areas:

- on the door knob on the inside of the range door
- on the plenum wall
- on the floor outside of the range
- on the front louver of the space heater

b) Generally we do not expect to find high levels of lead behind the firing line, if the ventilation is working correctly. I would have especially not expected to find lead in the Rutland IFR since it had been recently cleaned. However, these results indicate that the lead dust is definitely contaminating the area behind the firing line, as well as migrating outside of the range. This contamination most likely came from the weekend of firing after the range was cleaned. The strong result from the lead test is the effect of all of the lead-contaminated air being circulated behind the firing line. Once the ventilation system is operational, I suggest that the area behind the firing line be cleaned again to prevent personnel from tracking the lead dust and causing contamination of other areas of the building. A wet method would be best in this case to ensure a thorough cleaning. To prevent buildup of lead dust, a HEPA vacuum or wet method should be used to clean the firing line and the area behind the firing line after each day of firing.

3) Other.

a) The entrance door to the range is not sealed. Weather stripping on the door prevents any air from entering or exiting the range under the door. If the range becomes under positive pressure, weather stripping helps prevent lead dust from exiting the range. When the range is under negative pressure, weather stripping keeps air from entering around the door, which can disturb the airflow in the firing lane closest to the door.

b) At the time of the survey, a broom was being stored in the range. In accordance with NGR 385-15, dry sweeping of the range is not authorized. The only authorized cleaning methods are a HEPA vacuum or wet method. In addition, anything that has been stored in the range is considered to be contaminated with lead dust and must be disposed of as hazardous waste.

c) Some ceiling tiles were missing from the ceiling in the range as well as in the storage closet off of the range. These missing tiles could allow lead dust to migrate to other areas of the building and should therefore be replaced.

d) There was some concern about the sump-pump located in the range. The pump is covered with steel sheeting, which will prevent ricochets, and it seems to be fairly well sealed. However, I suggest checking with the state Environmental Office to ensure that in case of a flood or broken water pipe, the sump pump is sealed enough to prevent lead dust from flowing into a water source.

F. Recommendations

1) Reconnect the make-up air system and ensure that the firing range is not used unless the system is functioning properly. (RAC 2) [NGR 385-15, 3-2c(2)(a)]

2) Ensure the make-up and exhaust systems are interlocked to prevent the use of one without the other. (RAC 2) [NGR 385-15, (E-2b (1)(d)]

3) Remove the small forced-air heater from the range. Check with the VT Environmental Office to see if the heater must be disposed of as hazardous waste. (RAC 3)

4) Completely clean the area behind the firing line, including the plenum wall, prior to reopening the range. (RAC 3)

5) Install weather stripping on the entrance door to the range. (RAC 4) [Draft NGR 385-15 dated 23 July 1999]

6) Stop the practice of dry sweeping the range. (RAC 3) [NGR 385-15, Appendix B, paragraph 3d]

7) Replace the missing ceiling tiles in the range and in the storage closet off of the range. (No RAC Assigned)

8) Request that the VTARNG Environmental Office evaluate the potential for release of lead dust through the sump-pump in the event of excess water in the range. (No RAC Assigned)

9) Ensure a HEPA vacuum or wet method of cleaning is used to clean the firing line and the area behind the firing line after each day of firing. (RAC 3) [NGR 385-15, Appendix B, paragraph 4a]

10) This range should not be used for firing until the ventilation system is corrected and this office has evaluated the range.

APPENDIX A

REFERENCES

1. Department of Defense Instruction 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, October 1984.

2. TB MED 503, Occupational and Environmental Health, The Army Industrial Hygiene Program, February 1985.

3. NGR 385-15, Policy, Responsibilities, and Procedures for Inspection/Evaluation and Use of ARNG Indoor Firing Ranges, 30 March 1990.

4. Draft NGR 385-15, Policy, Responsibilities, and Procedures for Inspection/Evaluation and Use of ARNG Indoor Firing Ranges, 23 July 1999.

5. Occupational Safety and Health Administration (OSHA) Code of Federal Regulations (CFR), Title 29, Part 1910.1025, 1999 edition, Government Printing Office.

APPENDIX B
DERIVING RISK ASSESSMENT CODES (RACs)
FOR HEALTH HAZARDS
(Ref: DOD Instruction 6055.1)

STEP 1. 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

		Exposure Conditions			
		<CT	Occasionally - >CT Always - <STD	>CT ≤STD	>STD
AER	NO	0	3	5	7
POSSIBLE?	YES	1-2	4	6	8

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, \ parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

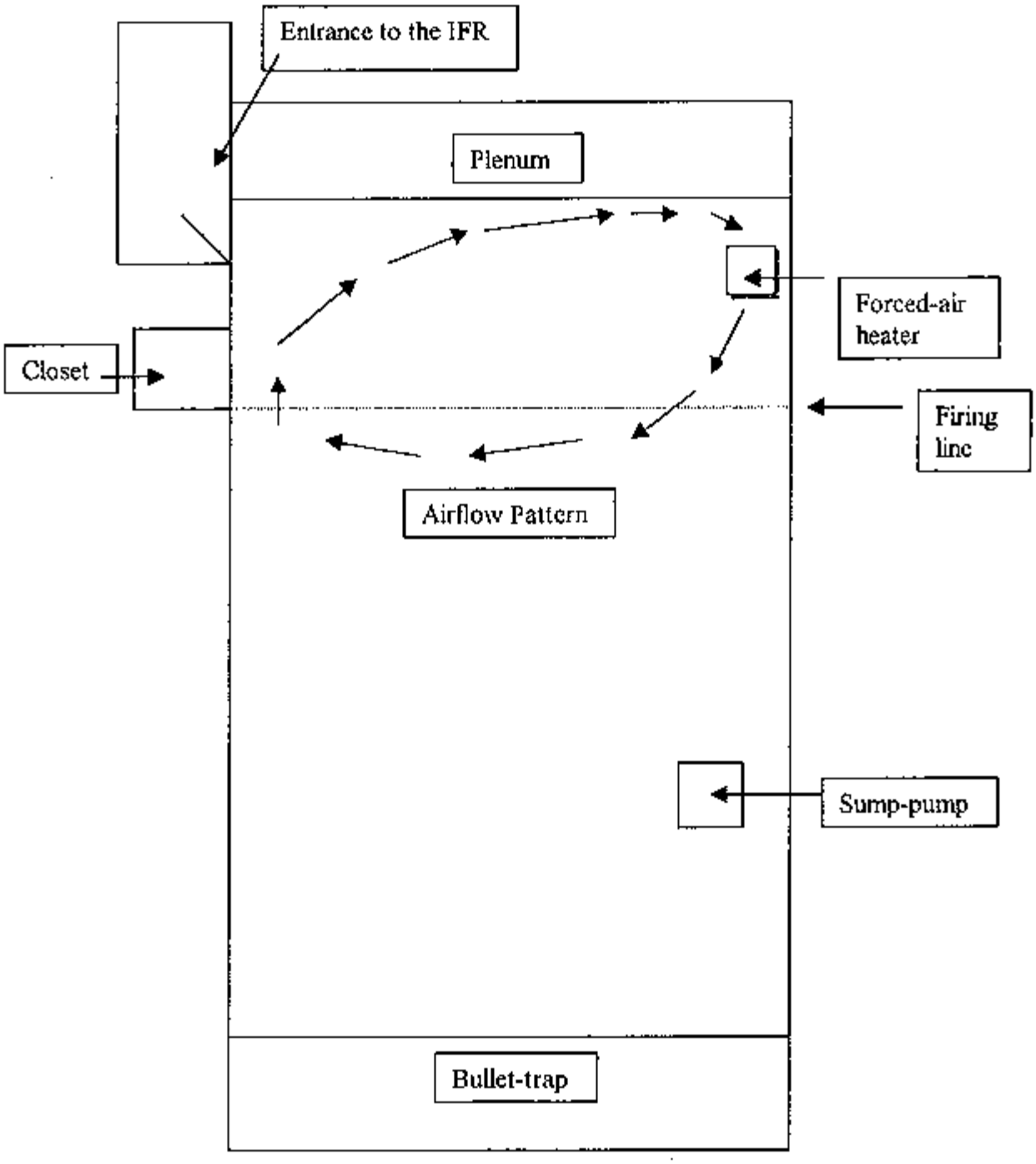
Total Points (sum of A and B, above)	MPC
14-16	A
10-13	B
5-9	C
<5	D

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

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

APPENDIX C

IFR DIAGRAM WITH AIRFLOW PATTERN



C

NATIONAL GUARD BUREAU
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 (40-5f) 10 August 1999

MEMORANDUM FOR Commander, HHC, 2/172 Armor, ATTN: CPT Non-Responsive
Armory, P.O Box 788, Rutland, VT 05701

SUBJECT: Indoor Firing Range (IFR), Rutland Armory

1. Enclosed is the industrial hygiene survey report on the Rutland Armory IFR completed by this office.

2. Please contact me at (410) 942-0273 or 1-800-550-6967 if you have questions or comments about this report.

Non-Responsive
Industrial Hygienist

Encl
Survey Report

CF:
Chief of Staff, VTARNG, ATTN: COL Non-Responsive
State Safety Manager, VTARNG, ATTN: LTC Non-Responsive
Occupational Health Nurse, VTARNG, ATTN: LTC Non-Responsive
Environmental Protection Manager, VTARNG: ATTN: MAJ Non-Responsive

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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 (40-5f) 4 December 2000

MEMORANDUM FOR The Adjutant General, VT ARNG, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range (IFR), Rutland Armory

1. Enclosed is the industrial hygiene survey report on the Rutland Armory IFR completed by this office.

2. Please contact me at (410) 942-0273 ext. 17 or 1-800-550-6967 if you have questions or comments about this report.

Non-Responsive

Encl
Survey Report

Industrial Hygienist

CF:
HQ 2/172 AR Bn, Rutland Armory, VTARNG, ATTN: 1LT Non-Responsive
State Safety Manager, VTARNG, ATTN: LTC Non-Responsive
Occupational Health Nurse, VTARNG, ATTN: LTC Non-Responsive
Environmental Protection Manager, VTARNG: ATTN: LTC Non-Responsive

Industrial Hygiene Survey Report

Vermont Army National Guard

Rutland Armory Indoor Firing Range
P.O. Box 788
15 West Street
Rutland, VT 05701

Prepared by:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301-IH Old Bay Lane
Havre de Grace, MD 21078

4 December 2000

Table of Contents

Appendices

I. Executive Summary

Ms Non-Responsive Regional Industrial Hygienist, performed an indoor firing range (IFR) survey at the Rutland Armory on 16 October 2000. The survey was scheduled as a follow-up visit to the last survey, which was performed in January 1999.

The make-up air ventilation system is still not working properly in this range. The system did not function at all on the winter setting. On the summer setting, the system creates excessive turbulence at the firing line. One problem is that the air is circulated around the firing line through a forced air heater hanging from the ceiling. Once the recommendations in this report are completed, the range should be reevaluated to ensure it is safe for firing. This evaluation should include ventilation measurements to check for the minimum airflow of 50 feet per minute (fpm) across the firing line and air sampling for lead during firing.

II. Table of Findings and Recommendations

Findings	Recommendations	RAC
Ventilation		
The smoke test demonstrated that the airflow in the range is not laminar and that during firing, lead dust would most likely be carried back through the firers' breathing zone and behind the firing line.	Perform maintenance on the make-up air system. Ensure the system works in the summer and winter settings, and that the airflow is laminar across the firing line with a minimum average of 50 fpm in each firing lane.	RAC 2
	Ensure the make-up and exhaust air systems are interlocked to prevent the use of one without the other.	RAC 2
	Install an automatic switch on the forced air heater to ensure it does not run while the firing range is in use.	RAC 3
	This range should not be used for firing until the ventilation system is corrected and this office has evaluated the range.	No RAC Assigned.
Other		
Many items are stored in the indoor firing range.	Remove all items currently stored in the range. These items must either be cleaned or disposed of as hazardous waste.	RAC 3
The entrance door to the range is not sealed.	Install weather stripping on the entrance door to the range.	RAC 4
At the time of the survey, a broom was stored in the range	Stop the practice of dry sweeping the range.	RAC 3
	Ensure a HEPA vacuum or wet method of cleaning is used to clean the firing line and the area behind the firing line after each day of firing.	RAC 3
There was some concern about the sump-pump located in the range.	Request that the VTARNG Environmental Office evaluate the potential for release of lead dust through the sump-pump in the event of excess water in the range.	No RAC Assigned

III. Report

A. Introduction

Ms. Non-Responsive Regional Industrial Hygienist, performed an industrial hygiene survey of the IFR at the Rutland Armory on 16 October 2000. The survey was scheduled as a follow-up visit to the last survey, which was performed in January 1999.

B. Scope of Work

Smoke candles were used to visualize the airflow in the range. In addition, ventilation measurements were taken to approximate the airflow through the plenum wall.

C. Health Effects of Lead

Lead is a cumulative poison that collects in the blood, bones and organs of the body such as the kidneys, brain and liver. Prolonged absorption of lead can result in severe gastrointestinal disturbances and anemia, with more serious intoxication leading to neuromuscular dysfunction. Lead can remain in the bones for decades and may be introduced into other parts of the body at a later date given the right circumstances. In indoor firing ranges, lead can enter the body by inhalation (breathing) and ingestion (by not washing hands before eating, drinking, smoking, or applying make-up or lip balm). Since children are particularly susceptible to lead's toxic effects, children and pregnant females should not be allowed to enter lead-contaminated areas such as indoor firing ranges. Soldiers, especially those with small children, should be aware of the potential for lead dust to be carried home on their clothing.

D. Methodology and Assessment Criteria

1) Evaluation criteria are the most stringent of those found in All States Log Number P00-0059 – Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR).

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

E. Findings and Discussion

1) Smoke Test and Ventilation.

a) The make-up air ventilation system is still not working properly in this range. On the winter setting, the system would run for approximately 60 seconds and then turn off. Maintenance personnel were not available at the time of the survey to determine if there is a problem with the temperature setting or if possibly the heating coils are not properly connected.

b) The system functioned on the summer setting. However, the smoke test demonstrated that the airflow in the range is not laminar and that during firing, lead dust would most likely be carried back through the firers' breathing zone and behind the firing line. This is not in accordance with the guidelines of All States Log Number P00-0059 – Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR), which states that the airflow should be uniform from wall to wall and floor to ceiling, moving downrange, with an average minimum airflow at the firing line of 50 feet per minute (fpm). This means that there shouldn't be turbulence in the range and that all of the air should be exhausted downrange. Unfortunately, in this range, the air at the firing line is very turbulent. Average airflow measurements at the firing line were not taken since the turbulence in the range would cause these measurements to be invalid.

c) The small forced air heater located in the range, which causes much of the air to circulate around the firing line, causes part of the turbulence in the range. Although this heater cannot be removed since it is needed to keep the pipes from freezing in the winter, a switch of some kind is needed to prevent the operation of this heater during firing. Otherwise, the airflow at the firing line will always be disrupted.

d) The air exiting the plenum wall is also not laminar. At 3 ½ feet, the average airflow was 300 fpm and at 5 feet, the average was 85 fpm. This problem was discussed with Harold Aksdale of VTARNG facilities engineering who stated that the airflow was laminar when the system was tested before being accepted. It is possible that all of the fans were not working at the time of the survey. If the fans are in fact working properly, one solution would be to add louvers to the end of the ventilation duct to evenly distribute the air behind the plenum wall.

2) Other.

a) The entrance door to the range is not sealed. Weather stripping on the door prevents any air from entering or exiting the range under the door. If the range becomes under positive pressure, weather stripping helps prevent lead dust

from exiting the range. When the range is under negative pressure, weather stripping keeps air from entering around the door, which can disturb the airflow in the firing lane closest to the door.

b) At the time of the survey, a broom was stored in the range. In accordance with All States Log Number P00-0059, dry sweeping of the range is not authorized. The only authorized cleaning methods are a HEPA vacuum or wet method. In addition, anything that has been stored in the range is considered to be contaminated with lead dust and must be disposed of as hazardous waste.

c) Many items are stored in the indoor firing range (i.e. chair, cart, safety goggles, etc.) These items should be removed for two reasons. One, they interfere with the airflow in the range and two, they become contaminated with lead dust. When these items are moved in and out of the range, the lead dust is carried through other parts of the building or to wherever the items are taken. See Section C of this report for the health effects of lead.

d) There was some concern about the sump-pump located in the range. The pump is covered with steel sheeting, which will prevent ricochets, and it seems to be fairly well sealed. There is another rectangle cutout in the floor, which had several holes in the cover that we were not able to remove. I suggest checking with the state Environmental Office to ensure that in case of a flood or broken water pipe, neither of these will allow lead dust from the range to flow into a water source.

F. Recommendations

1) Perform maintenance on the make-up air system and ensure that the firing range is not used unless the system is functioning properly. Ensure the system works in the summer and winter settings, and that the airflow is laminar across the firing line. (RAC 2) [All States Log Number P00-0059, 1-17b]

2) Ensure the make-up and exhaust systems are interlocked to prevent the use of one without the other. (RAC 2) [All States Log Number P00-0059, 1-17b(1)(m)]

3) Install an automatic switch on the forced air heater to ensure it does not run while the firing range is in use. (RAC 3)

4) Stop the practice of dry sweeping the range. (RAC 3) [All States Log Number P00-0059, 1-19e]

5) Remove all items currently stored in the range. These items must either be cleaned or disposed of as hazardous waste. (RAC 3) [All States Log Number P00-0059, 1-18a and 1-19c]

6) Install weather stripping on the entrance door to the range. (RAC 4) [DG 415-1, Appendix A]

7) Request that the VTARNG Environmental Office evaluate the potential for release of lead dust through the sump-pump in the event of excess water in the range. (No RAC Assigned)

8) Ensure a HEPA vacuum or wet method of cleaning is used to clean the firing line and the area behind the firing line after each day of firing. (RAC 3) [All States Log Number P00-0059, 1-33f]

9) This range should not be used for firing until the ventilation system is corrected and this office has evaluated the range.

APPENDIX A

REFERENCES

1. Department of Defense Instruction 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, October 1984.

2. TB MED 503, Occupational and Environmental Health, The Army Industrial Hygiene Program, February 1985.

3. NGR 385-15, Policy, Responsibilities, and Procedures for Inspection/Evaluation and Use of ARNG Indoor Firing Ranges, 30 March 1990.

4. All States Log Number P00-0059 – Policy and Responsibilities for Inspection, Evaluation, and Operation of ARNG Indoor Firing Ranges (IFR).

5. Occupational Safety and Health Administration (OSHA) Code of Federal Regulations (CFR), Title 29, Part 1910.1025, 1999 edition, Government Printing Office.

APPENDIX B
DERIVING RISK ASSESSMENT CODES (RACs)
FOR HEALTH HAZARDS
(Ref: DOD Instruction 6055.1)

STEP 1. 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

		Exposure Conditions			
		<CT	Occasionally - >CT Always - <STD	>CT ≤STD	>STD
AER	NO	0	3	5	7
POSSIBLE?	YES	1-2 4	6	8	

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, \ parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

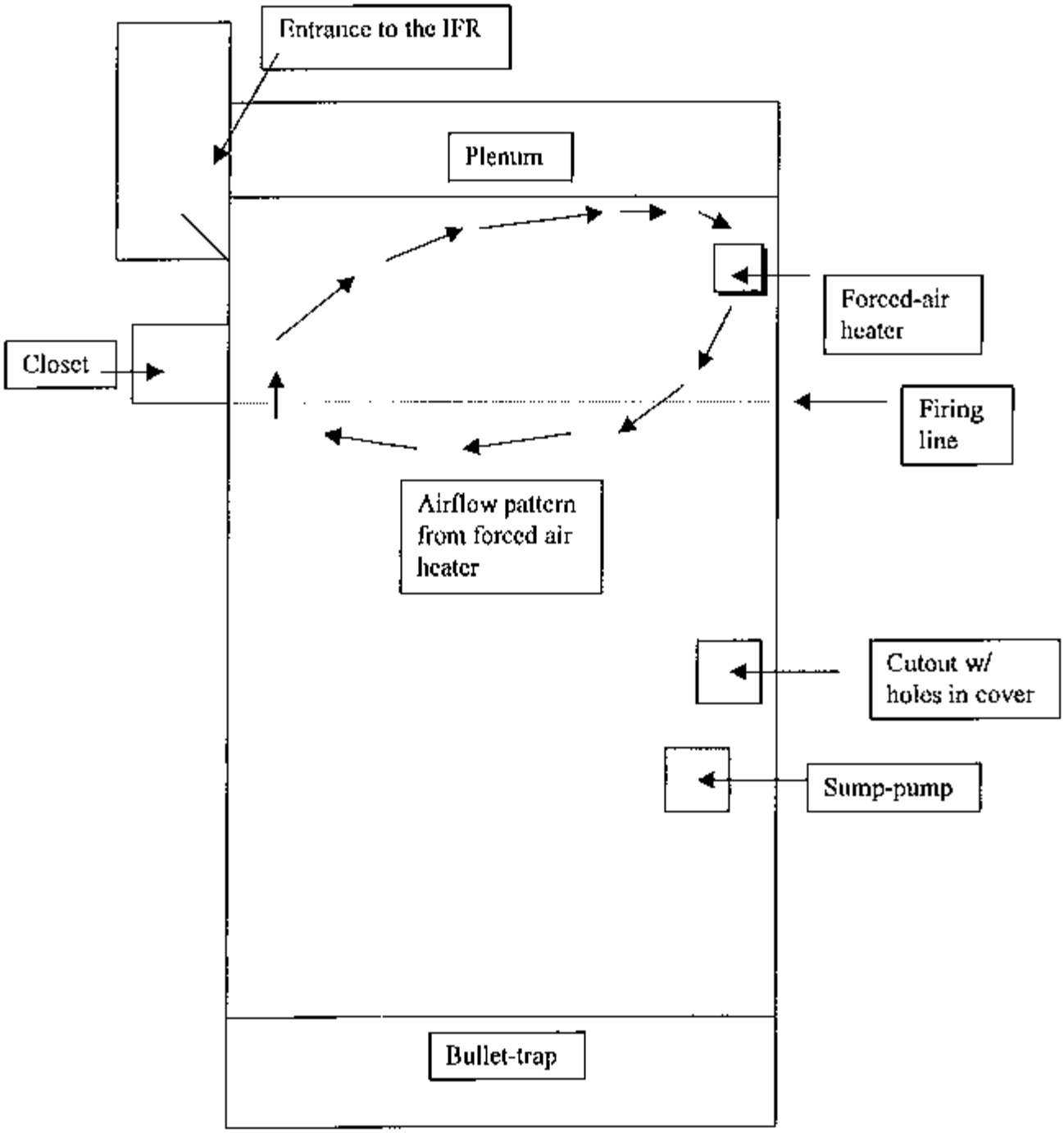
Total Points (sum of A and B, above)	MPC
14-16	A
10-13	B
5-9	C
<5	D

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

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

APPENDIX C

IFR DIAGRAM WITH AIRFLOW PATTERN



C

APPENDIX D

PHOTOGRAPHS

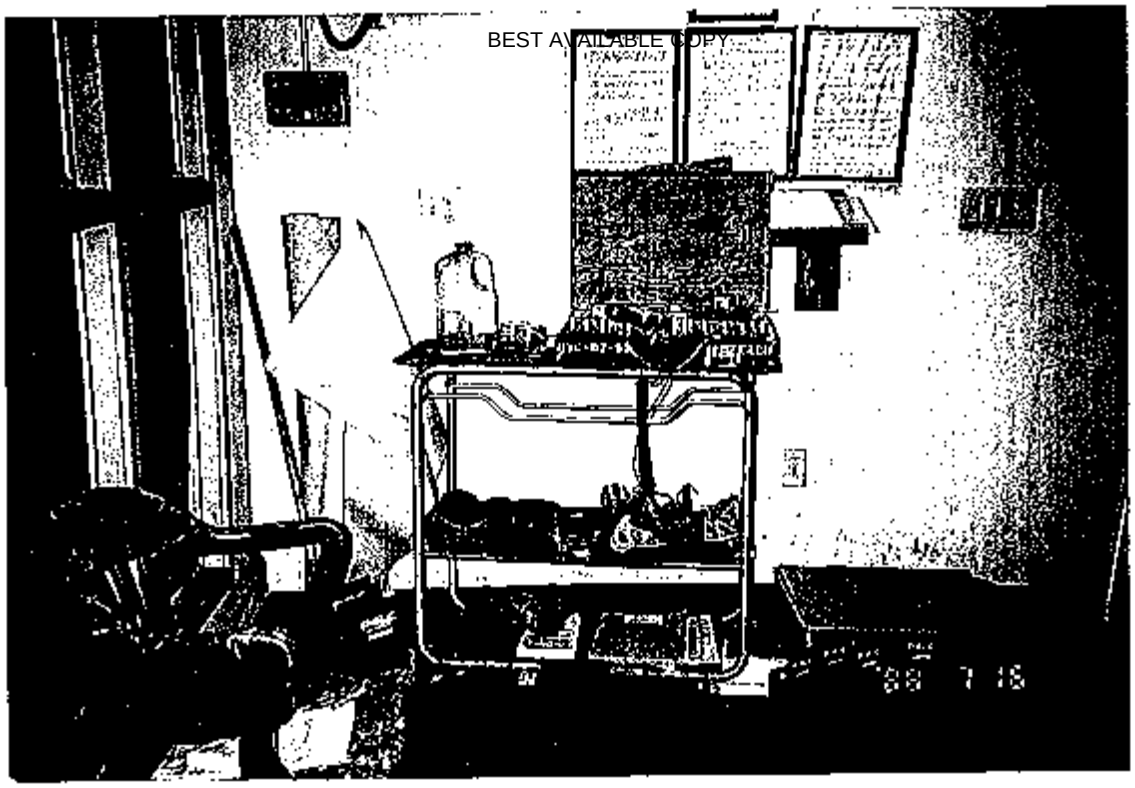


Figure 1. Misc items stored near plenum wall

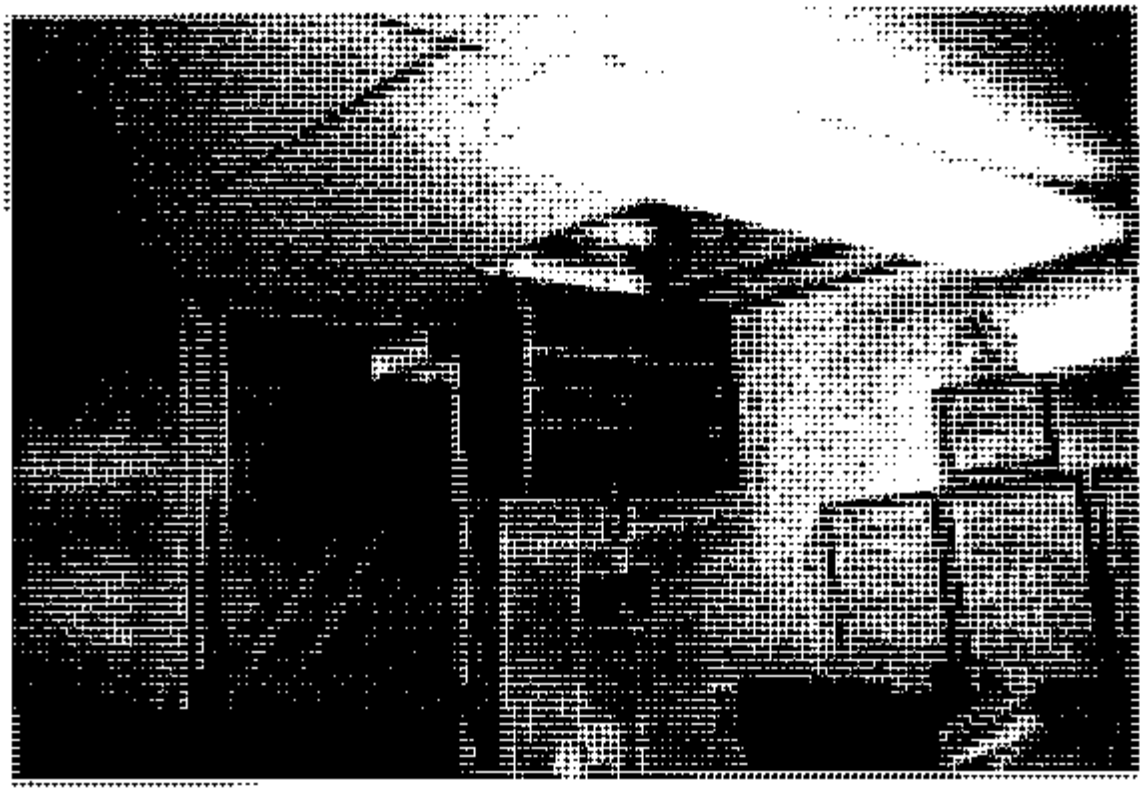


Figure 2. Forced air heater and misc items near plenum wall

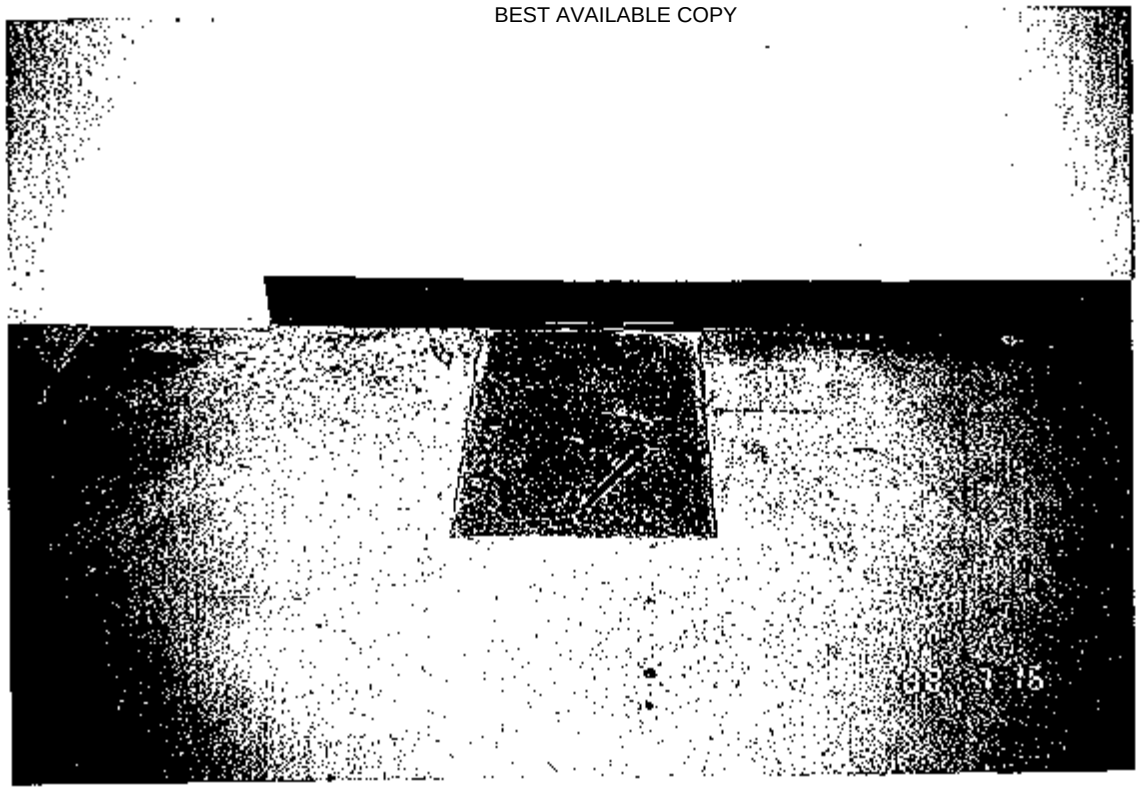


Figure 3. Rectangle cutout in floor

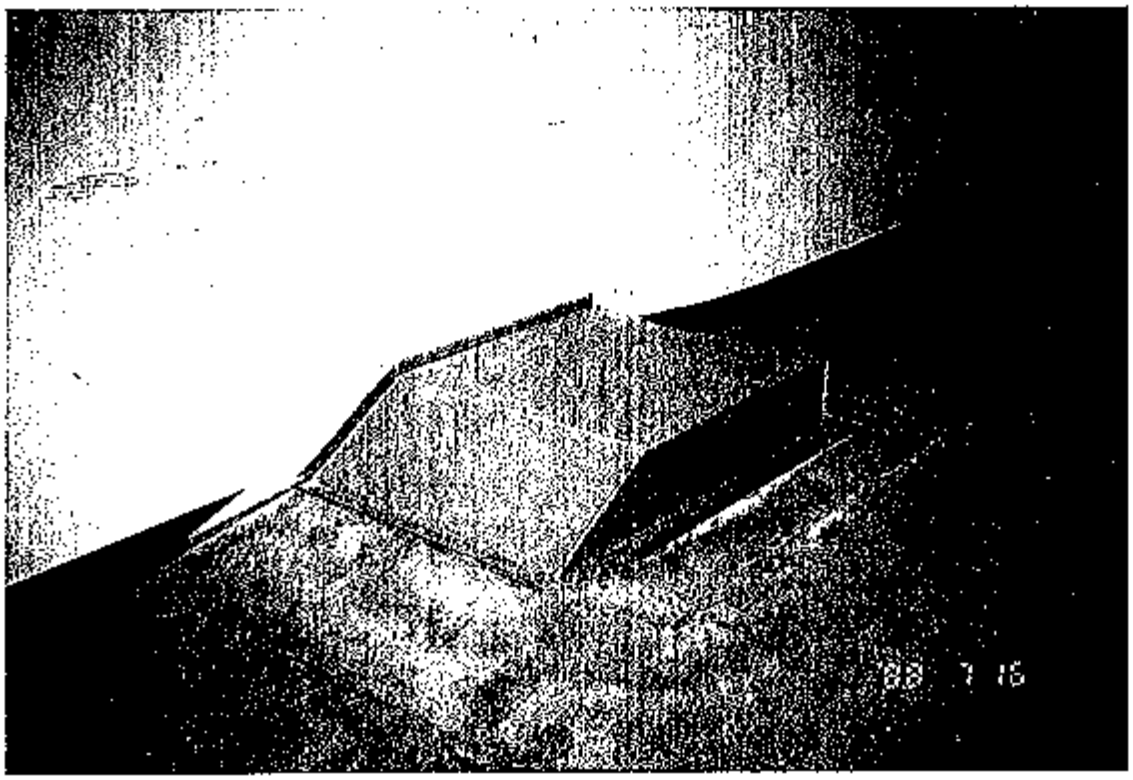


Figure 4. Sump pump

Roll #1 Film # 11-15 IFR Rutland, VT 16 Oct 00

Ventilation not working correctly on Winter setting. Runs for about 60 seconds + turns off. Have to hit reset. (temperature setting? if it doesn't reach the temp it kicks off?) maybe heat coils aren't turned on.

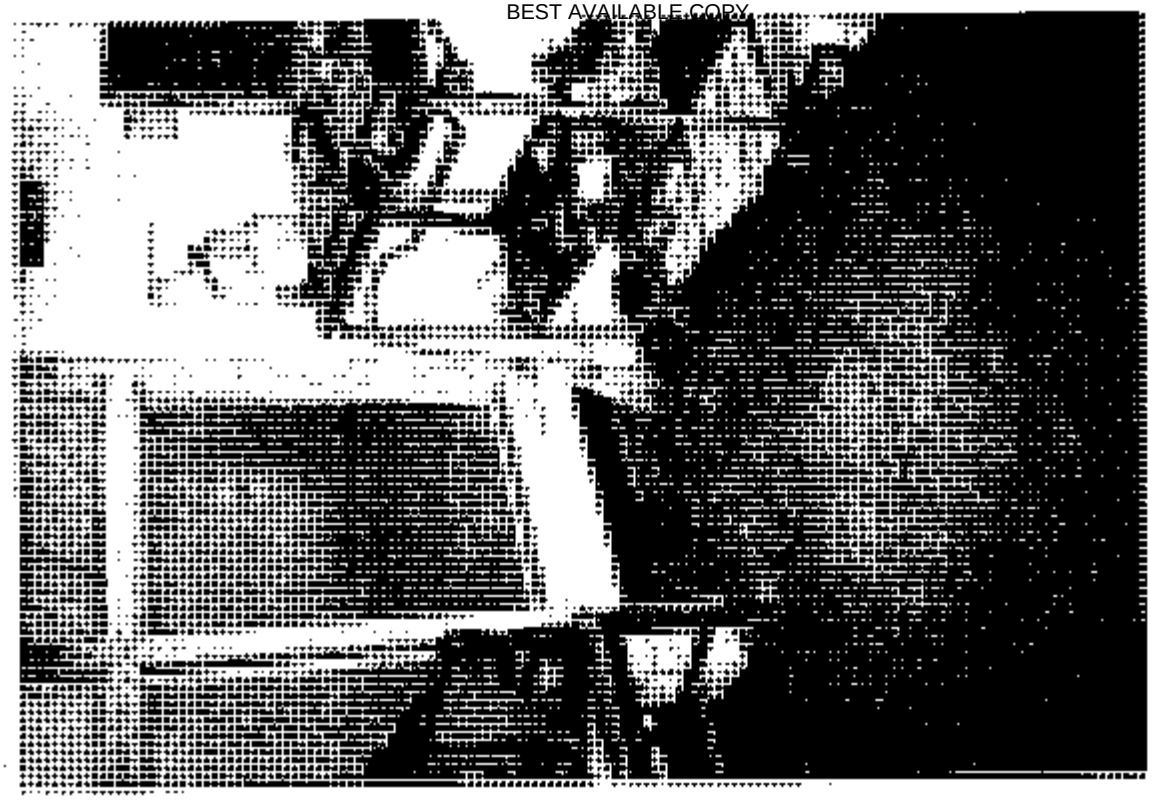
Works fine on summer setting.

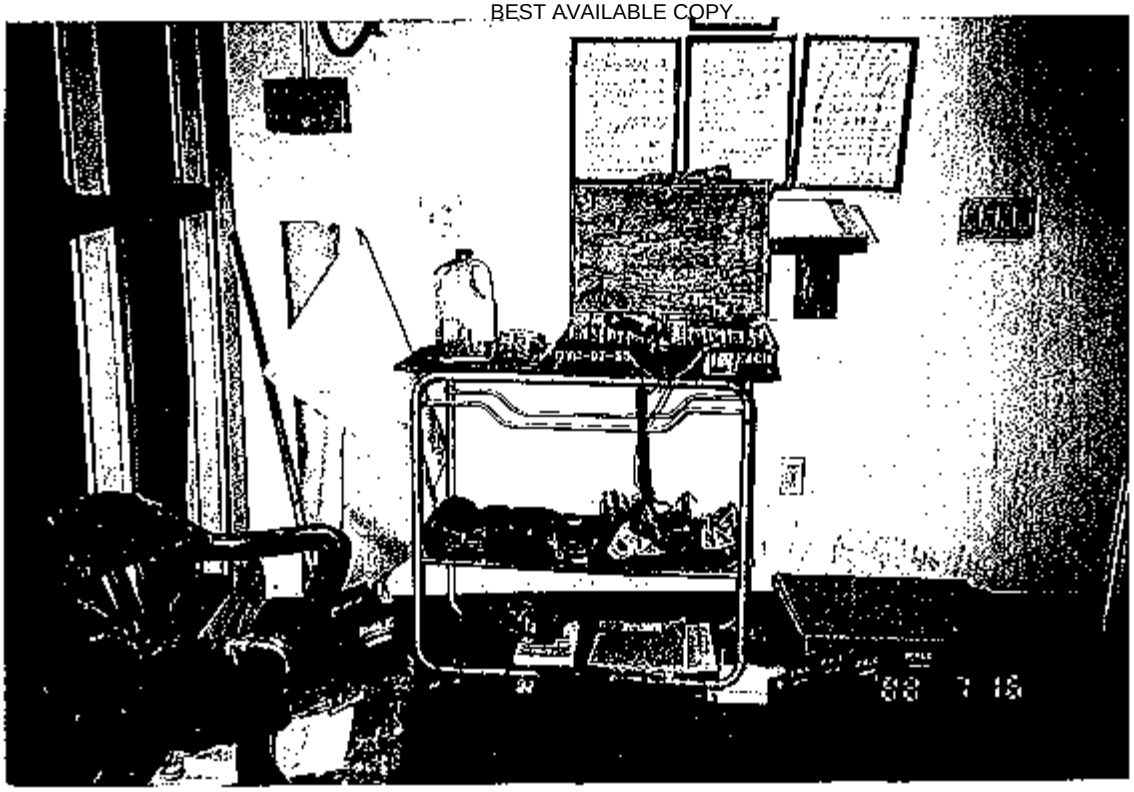
Small forced air heater still in room.

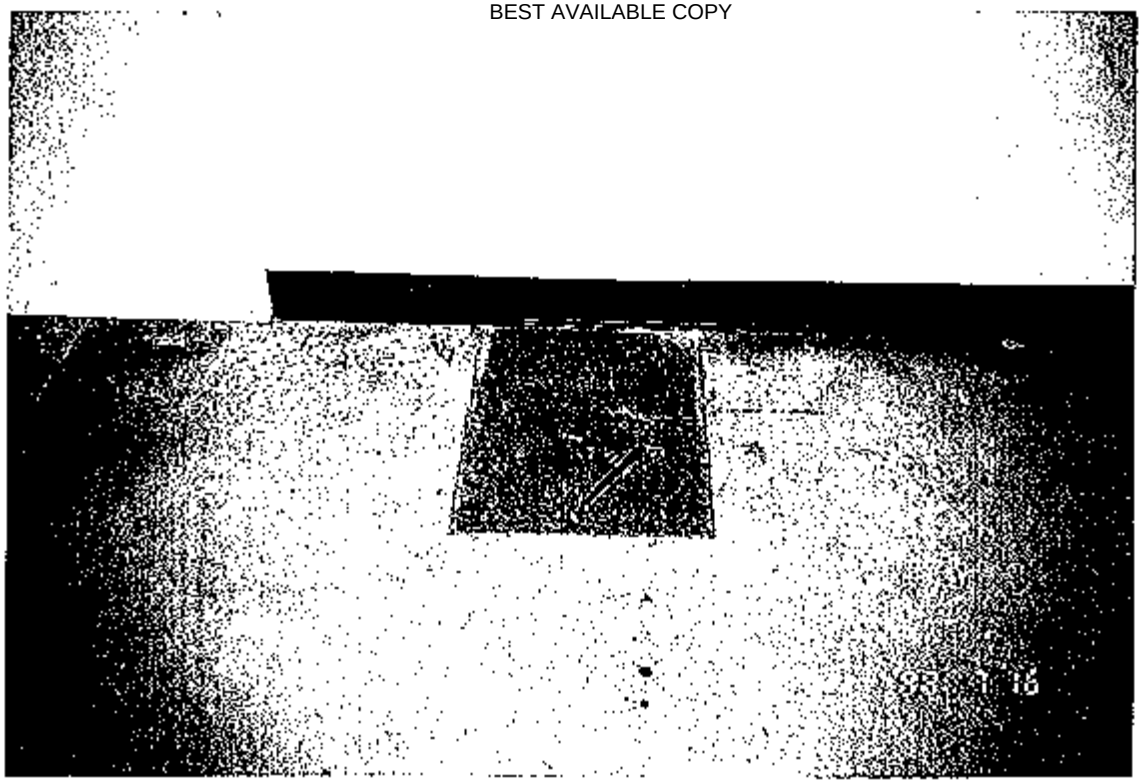
At plenum wall, at 3½ ft high, approx 300 fpm.

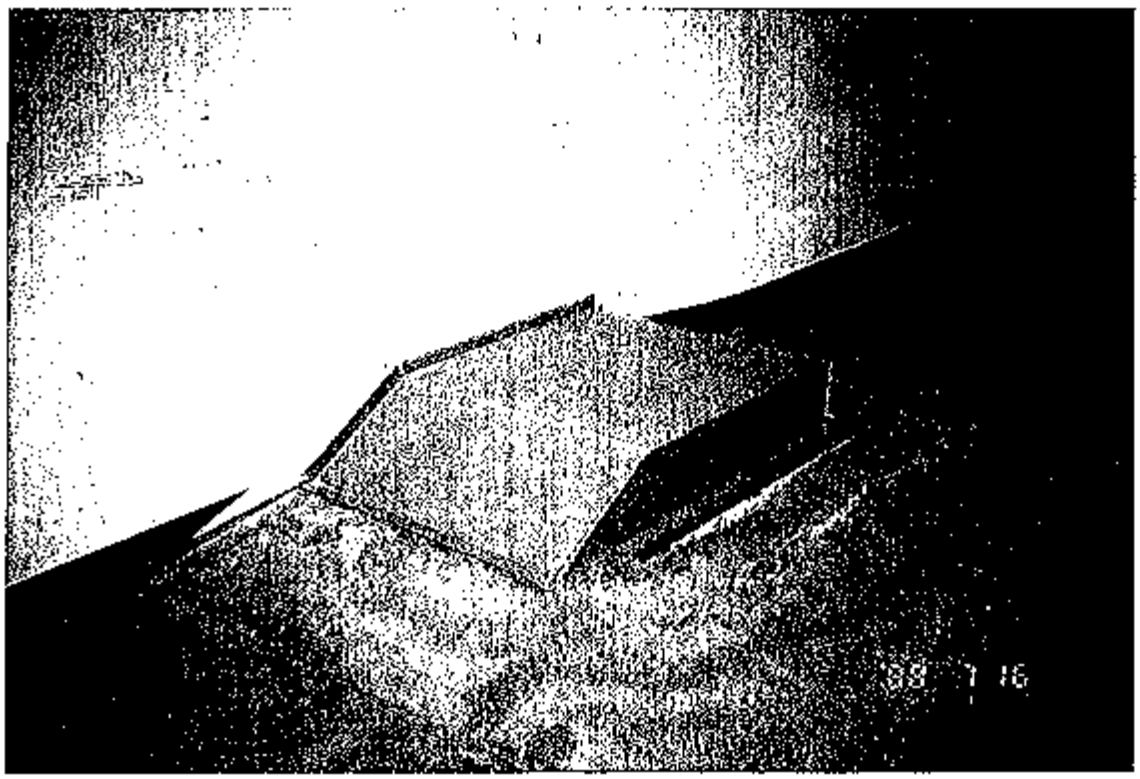
At 5 ft, approx 80 or 90 fpm.
Can we add louvers behind plenum wall? Or are all fans working?

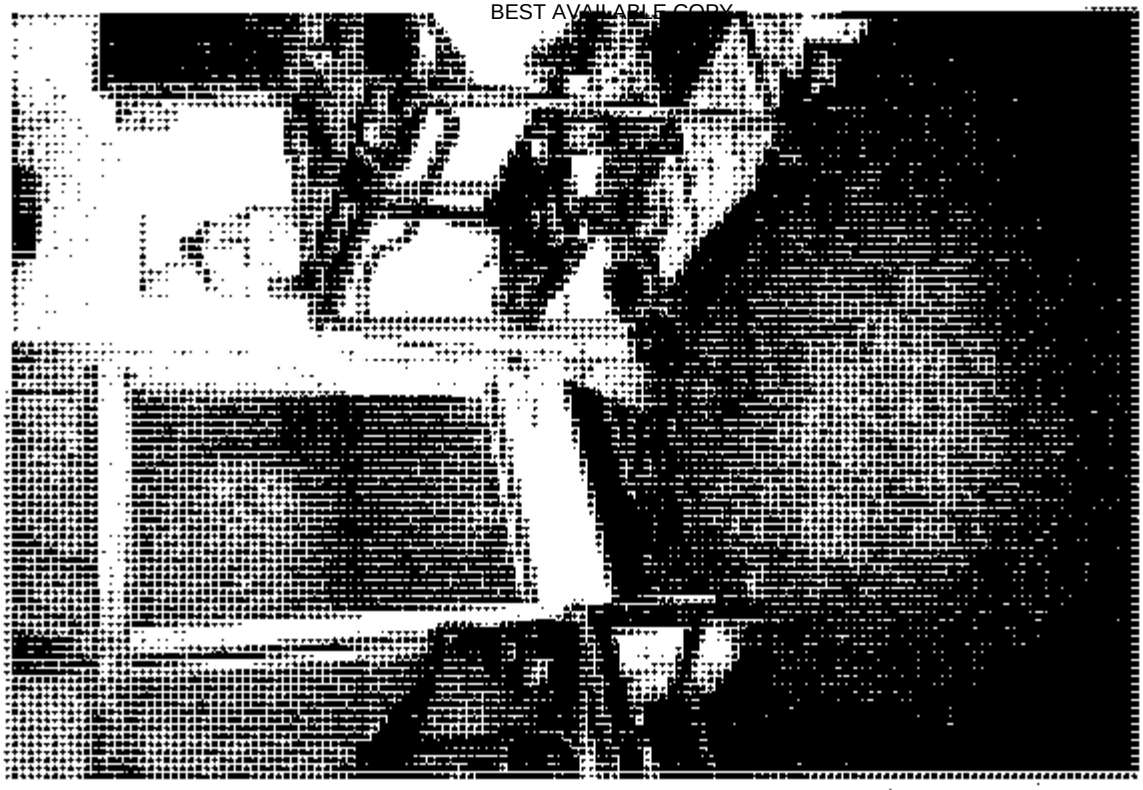
17 Oct 00 - Spoke w/ Harold Aksdale - facilities eng. he would like a copy of the report so he can respond & try to get the ventilation fixed.











ENVIRONMENTAL MANAGEMENT SOLUTIONS
INDUSTRIAL HYGIENE CONSULTING

Waterbury Armory
Indoor Firing Range

PO BOX 6893, DOUGLASVILLE, GEORGIA 30154
PHONE: 678.596.8509 • FAX: 770.234.6297

Table of Contents

EXECUTIVE SUMMARY

FINDINGS	RECOMMENDATIONS	RAC
The Waterbury indoor firing range is listed as active, however it is currently being used as storage space.	An official decision as to the status of this range should be immediately determined. If the range is to remain active, it must meet requirements set forth in NGR 385-15. If the range is to be converted, it must be adequately cleaned and decontaminated before employee use can resume.	RAC 2
Five of the twenty wipe sample results were above the maximum allowable limit of 200 micrograms per square foot. It is unclear what type of protocol janitors cleaning this range used.	If the range is to be converted, it must be cleaned in accordance with National Guard Regulations before employee use can resume.	RAC 2

SUBJECT: Industrial Hygiene Survey of the Waterbury Indoor Firing Range Survey performed 19 October 2000 at Waterbury Armory, VT.

BACKGROUND:

Introduction. At the request of Ms. Non-Responsive of the National Guard Bureau Region North Industrial Hygiene Office, an industrial hygiene survey was performed at the Waterbury Indoor Firing Range at the Waterbury Armory in Vermont. Ms Non-Responsive Non-Responsive contract industrial hygienist, Ms. Non-Responsive and Mr. Non-Responsive Regional Industrial Hygienists, and CPT Non-Responsive Occupational Health Nurse, Vermont Army National Guard, conducted the survey on 19 October 2000. The purpose of the survey was to perform a comprehensive industrial hygiene survey to evaluate range characteristics, ventilation, and quantify employee exposure to lead dust.

Site Description. The Waterbury Indoor Firing Range has not officially been closed and is still listed as an active range. The ventilation system, sand trap, and baffles are all still in place. Covered food items were present in the range.

Scope of Work. The Indoor Firing Range was visually examined and personnel were consulted to accurately assess potential hazards present. The range was evaluated using the wipe sampling protocol used in the National Guard Pamphlet 385-16, which addresses Indoor Firing Range conversion to other uses. Reference information, Instrumentation, Methodology, and Assessment Criteria can be found in Appendix A.

Health Effects and Hazard Determination. The most significant hazard present to employees and users of the indoor firing range is lead dust. Shooters using ammunition with lead primers or bullets manufactured with lead are exposed to lead fumes and dust during the firing process. Furthermore, the lead found in the primer, the melting of the bullet base by hot powder gasses, the shaving and abrasion of the bullet during firing, and fragmentation of the bullet at the point of impact are all potential sources for lead. Further exposure to lead may occur during cleaning of the range, guns, or bullet trap where lead dust is deposited. Lead deposits resulting from firing activities can build up in a firing range over time and must be adequately cleaned and sealed before the range is used for other purposes. If the range is not properly cleaned, the potential for exposure to employees who use the converted area remains.

Lead affects the nervous, circulatory, digestive, excretory, and reproductive systems of both men and women. Lead can build up in the body affecting the blood, heart, and immune systems, if the amount absorbed and stored in the body exceeds the body's ability to expel it. In children, slowed cognitive development and reduced growth are results of overexposure. Pregnant women overexposed to lead are more prone to spontaneous abortions or may give birth to babies with a low birth weight and slowed postnatal neurological development.

FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Five of the twenty wipe samples taken inside the range exceeded the limit of 200 micrograms per square foot. High levels were concentrated on the surfaces and lockers at or around the bullet trap, still present in the range. It is unknown, what type of protocol was used by janitors cleaning this range, and it is apparent that some lead contamination still exists. The range is still listed as active, but is being used as storage space for lockers and other equipment. If the range is to remain active, then all stored items must be removed and the range cannot be used for any other purpose than as a firing range. If the range will be officially closed and converted, the indoor firing range should be cleaned so that it is as free of lead dust as possible before the area is used for other purposes to include office space and storage. The following protocol should be used to clean the range and decontaminate items currently stored inside.

Recommendations.

1. Post signs restricting personnel from the range until it has been appropriately cleaned. **(RAC 2)**
2. No stored items should be handled or used until they have been thoroughly decontaminated. **(RAC 2)**
3. No eating, drinking, or use of tobacco products should occur in the area. [29 CFR 1910.1025 (i)(1)] **(RAC 2)**
4. Decide whether the range will be used for range activities (i.e. weapons qualification and firing) or if it would be better suited for storage and office space. The indoor firing range should not be used for both activities. [NGR 385-15, NG PAM 385-16] **(RAC 2)**

    a. If the range is to remain active, the range cannot be used for any purpose other than firing. No equipment or furniture can be stored or maintained in the range. The range must meet all requirements of the National Guard Regulation 385-15 regarding Indoor Firing Ranges. Contact the Regional Industrial Hygiene Office regarding requirements. [NGR 385-15 1-18a, 1-17d] **(RAC 2)**

    b. If the range is to be used as a storage area and office space, it must be thoroughly decontaminated, reevaluated, and approved prior to its use. Follow all described procedures for cleaning and decontamination of the range and all stored items found in Appendix C. **Contact the Regional Industrial Hygiene Office for approval and reevaluation prior to and after cleaning. (RAC 2)**

Non-Responsive

Industrial Hygienist

APPENDIX A

REFERENCES

AR 40-5, Preventative Medicine, 15 October 1990.

AR 385-10, The Army Safety Program, 23 May 1988.

National Guard Regulation (NGR) 385-10, Army National Guard Safety and Occupational Health Program, 29 December 1989.

National Guard Regulation (NGR) 385-15 Policy Responsibilities, and Procedures for Inspection/Evaluation and use of ARNG Indoor Firing Ranges, 18 September 2000..

National Guard Pamphlet (NG PAM) 385-16, Guidelines for Converting Firing Ranges to Other Uses, 31 January 1994.

TB MED 503, The Army Industrial Hygiene Program, February 1985.

TB MED 502, Occupational Safety and Health Respiratory Protection Program..

Title 29 Code of Federal Regulations (CFR) 1910.1025, Lead.

Instrumentation

The industrial hygiene survey was conducted utilizing the following pieces of equipment:

Rite Aid Towelettes with Benzalkonium Chloride 1:750, 5% Denatured Alcohol
4" X 4" Template

Methodology.

A. *Wipe Samples.* Wipe samples were taken utilizing the protocol as set forth by NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. Details of locations where wipe samples were taken can be found in Appendix D.

Assessment Criteria.

A. Wipe Samples. Wipe sample results were compared with Ventilation rates were compared with the NG PAM 385-16, Guidelines for Converting Firing Ranges to Other Uses. See previous page for Reference information.

B. Risk Assessment Codes. Risk Assessment Codes (RACs) are included in this report to quantify the risk of particular operations to employees and to establish funding priorities for corrective actions. RACs are assigned with regard to hazard severity and mishap probability. The type, length, and route of exposure are taken into consideration, as are the medical effects that would occur with such exposures. RAC criteria can be found in Appendix B.

APPENDIX B

DERIVING RISK ASSESSMENT CODES (RACs) FOR HEALTH HAZARDS (Ref: DOD Instruction 6055.1)

STEP 1. 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

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

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

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

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

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

APPENDIX C

Decontamination and Cleaning Protocol

1. Ensure that all procedures listed below comply all federal, state, and local regulations. Consult the Regional Industrial Hygiene Office and State Environmental Office for further guidance.

2. **Ventilation System**
   i. The range ventilation system must be in operation during all cleaning activities. If no ventilation system is available all doors and windows must be kept sealed to prevent contamination of other areas.

3. **Materials**
   i. A High Efficiency Particulate Air (HEPA) filtered vacuum system is the preferred method of cleanup. If a HEPA vacuum cannot be obtained a wet method, detailed below, should be utilized. **A high-pressure water system or dry sweeping may not be used.**
   ii. A cleaning solution containing detergent and water is recommended. New solutions of detergent and water should be mixed frequently.
   iii. Two containers should be used; one for wetting the applicator (rags, sponge, mop) and the other for rinsing once the dust has been wiped from the surfaces.
   iv. Wastewater in containers can be left to evaporate. Any waste left in the buckets and applicators should be disposed of as hazardous waste. Consult the Environmental Office for appropriate disposal instructions.
   v. Personnel responsible for decontamination of the range and stored items should be provided with a full face air purifying respirator with a N100 filter or HEPA filter cartridge providing that all requirements for placing employees in respiratory protection have been met as detailed in 29 CFR 1910.134. Employees should be provided with protective coveralls with hood and shoe covers (i.e. Tyvek™ full body suit). Protective clothing should be hanged daily at the end of the shift and more frequently if the suit becomes grossly contaminated. If cotton coveralls are provided then the employer must provide for maintenance and laundering of protective clothing. Protective clothing should not be taken home and prior to leaving the work area, personnel should thoroughly HEPA vacuum clothing to prevent lead dust from leaving the area. Work and street clothing should not be stored together.

4. **Order of Cleaning**
   i. A progression of cleaning from top to bottom and from behind the steel backstop to the firing line should be used. All surface areas in the range must be cleaned. Stored items must be decontaminated prior to removal.
   ii. After removing the sand and the steel backstop, areas in front of and behind the bullet trap along with the steel backstop plates should be cleaned.
   iii. The ceiling, lights, baffles, retrieval system, heating systems, and ventilation ducts should be cleaned.
   iv. Acoustical material should be vacuumed instead of being painted over, A Toxic Characteristic Leaching Procedure (TCLP) may need to be used for

acoustical material and the like to determine if the material need to be classified as hazardous and disposed of accordingly. The Environmental Office should be contacted regarding this testing.

v. The floor should be the last surface cleaned starting at the bullet trap and ending behind the firing line. Concrete floors should be sealed with deck enamel and linoleum on tile floors should be waxed.

vi. All walls should be painted, preferably with a sealant, that will help prevent leaching of lead after covering.

vii. Following the wet cleaning of the area and after all surfaces have been allowed to dry thoroughly, a HEPA vacuum should be used on all surfaces, until no dust or residue can be seen. A through inspection to detect surface dust should be made following cleanup.

viii. The Regional Industrial Hygiene Office should be contacted for clearance sampling and to approve the range for converted use.

5. **Decontamination of stored items.**

i. All stored items must be decontaminated before removing them from the range. Stored equipment next to the bullet trap and firing line should be decontaminated first.

ii. A HEPA vacuum or wet cleaning method should be used. Every attempt should be made to clean the item before disposing as hazardous waste to reduce cost and waste.

iii. Porous items such as canvas tents or other fabrics may be laundered at companies, which specialize in industrial laundry services. Office partitions and carpeting present during firing should be considered grossly contaminated and disposed of as hazardous waste. Consult the Environmental office before removing and disposing of items.

6. **Medical Surveillance.**

i. A preplacement medical examination is required for all individuals involved with range cleanup operations.

7. **Air Monitoring.**

i. Worker breathing zone air samples must be collected during range cleanup to ensure that workers are not overexposed and to evaluate clean up procedures.

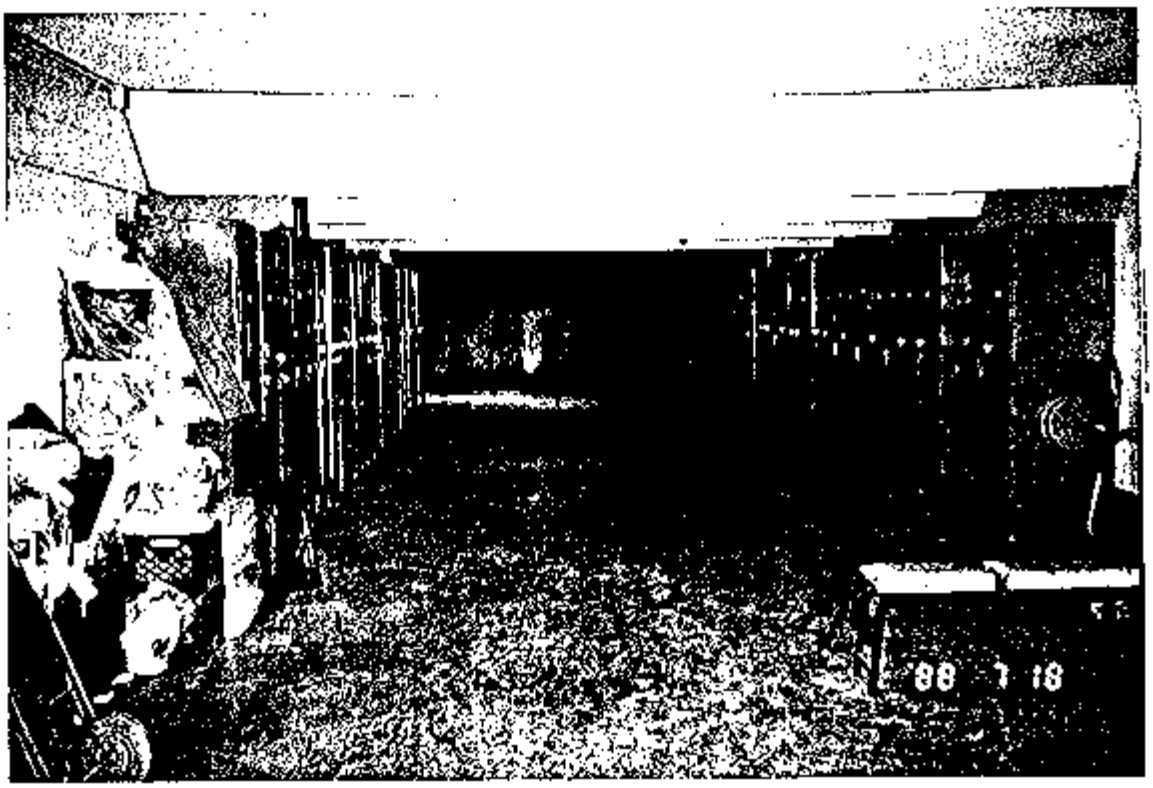
8. **Hazard Training**

i. A training program must be instituted for all individuals who are subject to exposure to lead at or above the action level of for whom the possibility of skin or eye irritation exists. This training should be provided for all personnel currently involved in rang cleanup operations at least annually.

APPENDIX D

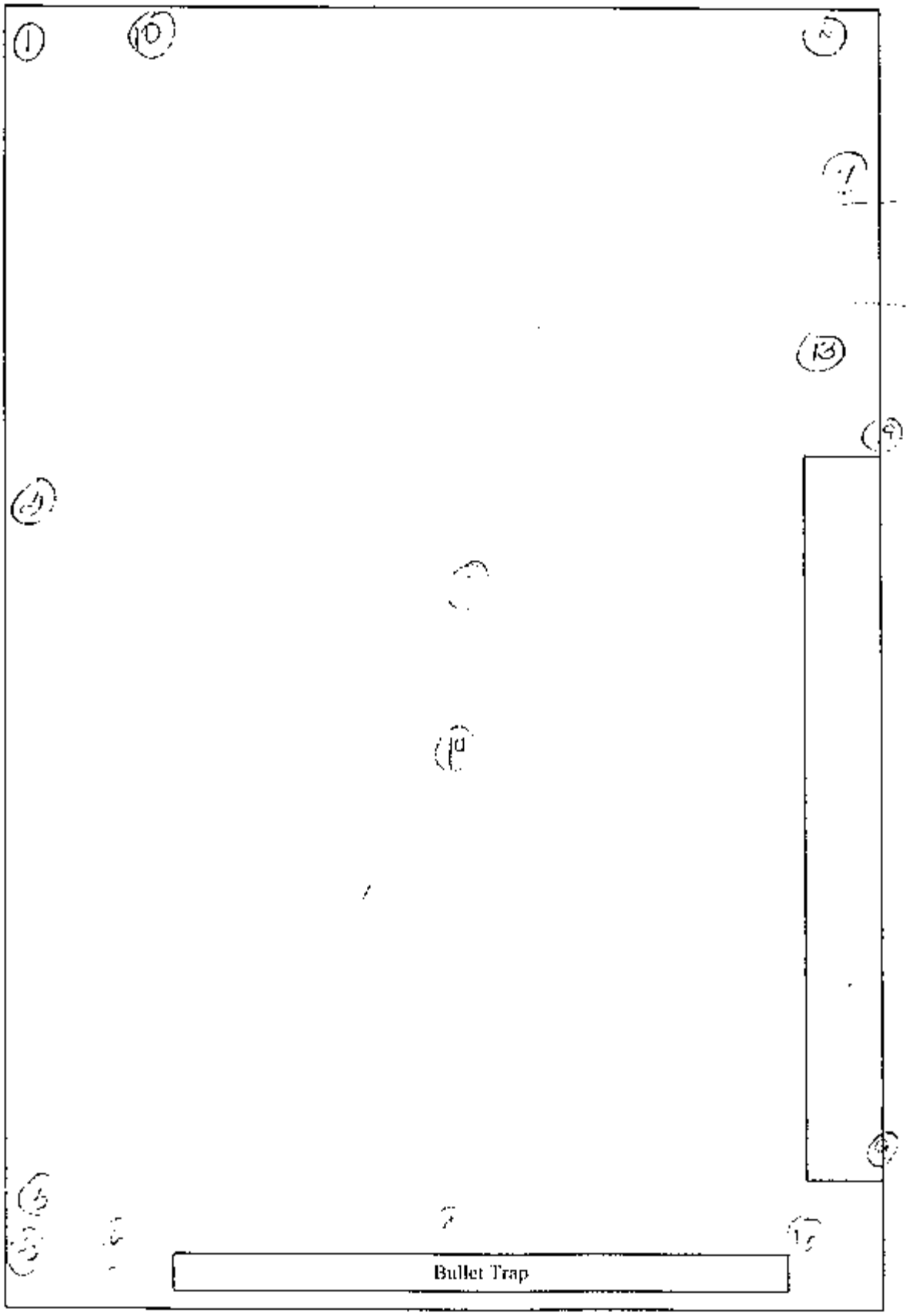
Waterbury Indoor Firing Range

Downrange storage.
Note food items wrapped in plastic.



Stored items in front of the firing line.

Waterbury Indoor Firing Range



Environmental Management Solutions

APPENDIX E

Sample Number	Location	Micrograms/Sample	Micrograms/ Square Foot	Within Allowable Limits?
WB-01	Left wall, 9', Left corner	<3	<27	Y
WB-02	Left wall, 2' before lockers	<3	<27	Y
WB-03	Left wall, 5', near bullet stop	<3	<27	Y
WB-04	Back wall, 9', right corner	<3	<27	Y
WB-05	Back wall, 5', middle	<3	<27	Y
WB-06	Back wall, 1', left corner	<3	<27	Y
WB-07	Right wall, 2', right corner before door	<3	<27	Y
WB-08	Right wall, 5', before lockers	<3	<27	Y
WB-09	Right wall, 8', in front of bullet trap	<3	<27	Y
WB-10	Ceiling, left corner	<3	<27	Y
WB-11	Ceiling, 2nd baffle, middle	9.7	87.3	Y
WB-12	Ceiling, light fixture, right corner	14	126	Y
WB-13	Floor, right corner, in front of door	8.4	75.6	Y
WB-14	Floor, middle between 2nd and 3rd baffles	<3	<27	Y
WB-15	Floor, near bullet stop behind locker	150	1350	N
WB-16	Bullet stop, 3', right	860	7740	N
WB-17	Bullet stop, 5', middle	2000	18000	N
WB-18	Bullet stop, 8', left	190	1710	N
WB-19	Top of locker, near bullet stop in front of the 4th baffle, right corner	180	1620	N
WB-20	Outside of door, left (exiting) 6" from wall	16	144	Y
WB-21	BLANK	<3	<27	Y
WB-22	BLANK	<3	<27	Y

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVN-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVN-SI (40-5f) 12 January 2001

MEMORANDUM FOR The Adjutant General, VT ARNG, ATTN: State Safety Office (LTC Non-Responsive, G.M.A., Camp Johnson, Colchester, VT 05446-3004

SUBJECT: Indoor Firing Range Survey at Waterbury Armory

1. Enclosed is the industrial hygiene survey report prepared by Environmental Management Solutions. I concur with the overall recommendations made by Ms. Non-Responsive

2. Please call me at 410/942-0273 ext. 17 if you have any questions or comments about this report.

Non-Responsive
Regional Industrial Hygienist

Encl
Survey Report

CF:
Unit Commander
Facility Engineer, COL Non-Responsive

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NATIONAL GUARD BUREAU
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 (40-5f) 27 May 1999

MEMORANDUM FOR Commander, Company B, 2/172 AR Bn, P.O. Box 125, Westminster, VT 05158

SUBJECT: Indoor Firing Range (IFR), Westminster Armory

1. Enclosed is the industrial hygiene survey report on the Westminster Armory IFR completed by this office. This survey was scheduled to be a complete evaluation of the range since it was my understanding at the time that the range was still being used for firing. Since this is not the case, the survey was conducted to establish the exposure potential based on the current use of the IFR.

2. Please contact me at (410) 942-0273 or 1-800-550-6967 if you have questions or comments about this report.

Non-Responsive

Encl
Survey Report

// Industrial Hygienist

CF:
Chief of Staff, VTARNG, ATTN: COL Non-Responsive
Occupational Health Nurse, VTARNG, ATTN: LTC Non-Responsive
Environmental Protection Manager, VT ARNG, ATTN: MAJ Non-Responsive

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Industrial Hygiene Survey Report
for
Vermont Army National Guard
(VTARNG)

at
Westminster Armory Indoor Firing Range
P.O. Box 125
Westminster, VT 05158

Prepared by:
National Guard Bureau
Army National Guard
Region North Industrial Hygiene Office
301-H1 Old Bay Lane
Havre de Grace, MD 21078

27 May 1999

Table of Contents

Appendices

I. Executive Summary

Ms. [redacted] Regional Industrial Hygienist, performed an indoor firing range (IFR) survey at the Westminster Armory on 12 January 1999. The survey was scheduled in accordance with NGR 385-15 (reference 3) which requires biennial inspections of all active indoor firing ranges. Upon arrival at the Westminster Armory, armory personnel reported that the IFR would not be used for firing since the range has not been retrofitted to meet current ventilation and building requirements. The current plan is to use the range for training and storage of various items. At that time, it was decided to evaluate the range to ensure it met the standards for conversion to other uses.

A physical inspection of the IFR showed that the conditions for conversion of the IFR to other uses had not been met based on the fact that the bullet trap and baffles had not been removed from the range. In addition, wipe sample results indicate levels of lead dust which are too high to meet the requirements for conversion of the range. The IFR does not currently meet safety and health requirements for firing or for conversion to other uses. Some type of action must be taken to ensure the firing range is used for an authorized purpose. The recommendations in the report include the steps to take if the goal is 1) to re-open the range for firing, or 2) to convert the range for other uses.

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II. Table of Findings and Recommendations

Westminster Armory Indoor Firing Range P.O. Box 125 Westminster, Vermont		
Findings	**Recommendations**	**RAC**
Range Use		
This range is not being utilized in accordance with the requirements of NGR 385-15, paragraph 3-4, which states that ranges will not be used for anything other than firing.	Discontinue the practice of storing items and training soldiers in the Westminster IFR. [NGR 385-15, paragraph 3-4]	RAC 2
	For conversion of the range to other uses, such as storage, follow the guidance in NG PAM 385-16.	No RAC Assigned
None of the 9 wipe samples taken were below 200 $\mu g/ft^2$. The sample with the highest concentration of lead was taken on the bullet trap, which had not been cleaned.	Post a DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, on the entrance to the range. [29 CFR 1919.1025(h), NG Pam 385-16, NGR 385-10 and AR 385-10]	RAC 2
Ventilation		
The ventilation system was not evaluated due to items being stored in the range. However, based on the facts that 1) there is no plenum wall to ensure laminar flow in the range and 2) there is not a sealed door between the stairs and the entrance to the range, it is fairly certain that the range would not be considered safe for firing. In order to reopen the range for firing, it would have to be retrofitted and re-evaluated based on current standards.	Do not allow firing on the Westminster IFR unless the range has been retrofitted to meet current requirements. [NGR 385-15, 3-3c and DG 415-1, Appendix A]	RAC 3
	A re-evaluation of the range to include air sampling must be accomplished prior to opening the range for firing and biennially thereafter. [NGR 385-15, Chapter 4]	No RAC assigned

III. Report

A. Introduction

1) Ms. Non-Responsive Regional Industrial Hygienist, performed an industrial hygiene survey of the IFR at the Westminster Armory on 12 January 1999. The survey was scheduled in accordance with NGR 385-15 (reference 3) which requires biennial inspections of all active indoor firing ranges.

2) Advanced Abatement Technologies, Inc (AAT) cleaned the Westminster Armory IFR in December 1998. This was a routine cleaning of all surfaces, excluding the bullet trap, which MAJ Non-Responsive of the VTARNG Environmental Office arranged for all IFRs in the state of Vermont. The cleaning process was scheduled as periodic cleaning and was not accomplished to convert the IFRs to any other use. In a memorandum from the VTARNG Environmental Office to all command and staff elements dated 13 November 1998, MAJ Non-Responsive makes it clear that use of firing ranges for anything other than firing is unauthorized.

B. Scope of Work

Wipe samples were taken to characterize the exposure potential to lead for personnel using the indoor firing range. In accordance with 29 CFR 1910.1025(h), "all surfaces shall be maintained as free as practicable of accumulations of lead". NG Pam 385-16 (reference 4) requires that ranges converted to other uses have lead levels less than 200 $\mu g/ft^2$.

C. Health Effects of Lead

Lead is a cumulative poison that collects in the blood, bones and organs of the body such as the kidneys, brain and liver. Prolonged absorption of lead can result in severe gastrointestinal disturbances and anemia, with more serious intoxication leading to neuromuscular dysfunction. Lead can remain in the bones for decades and may be introduced into other parts of the body at a later date given the right circumstances. In indoor firing ranges, lead can enter the body by inhalation (breathing) and ingestion (by not washing hands before eating, drinking, smoking, or applying make-up or lip balm). Since children are particularly susceptible to lead's toxic effects, children and pregnant females should not be allowed to enter lead-contaminated areas such as indoor firing ranges. Soldiers, especially those with small children, should be aware of the potential for lead dust to be carried home on their clothing.

D. Methodology and Assessment Criteria

1) Exposure standards used in this report are the most stringent of those found in NG PAM 385-16, Guidelines for Converting Indoor Firing Ranges to Other Uses.

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

E. Findings and Discussion

1) Range Use

a) This range is not being utilized in accordance with the requirements of NGR 385 -15, paragraph 3-4 which states that ranges will not be used for anything other than firing. The range is currently being used for storage of various tables and shelves as well as two armored tanks. In addition, due to severe winter weather conditions, soldiers are being trained on the tanks in the indoor firing range.

b) In accordance with NG Pam 385-16, sample results must be below 200 $\mu g/ft^2$ before the range will be approved as being properly cleaned for conversion to another use. None of the 9 wipe samples taken were below 200 $\mu g/ft^2$. The sample with the highest concentration of lead was taken on the bullet trap, which had not been cleaned. See Appendix C for wipe sample results.

c) Given the fact that the range has not been properly decontaminated for conversion to another use, the practices of storing items and training soldiers in the range is unsafe. For proper conversion, the bullet trap must be completely removed. In addition, the entire range (including the area behind the bullet trap) must be cleaned and painted with an encapsulating sealant prior to conversion. The cleaning contract with AAT did not include cleaning or removal of the bullet trap. [For more guidance on conversion of IFRs, see NG Pam 385-16 (reference 4)].

2) Ventilation

The ventilation system was not evaluated due to items being stored in the range which would interfere with proper airflow. However, based on the facts that 1) there is no plenum wall to ensure laminar flow in the

range and 2) there is not a sealed door between the stairs and the entrance to the range, it is fairly certain that the range would not meet current ventilation requirements to be considered safe for firing. In order to reopen the range for firing, it would have to be retrofitted and re-evaluated based on current standards.

F. Recommendations

1) Discontinue the practice of storing items and training soldiers in the Westminster IFR. (RAC 2) [NGR 385-15, paragraph 3-4]

2) Post a DA Form 4753, Notice of Unsafe or Unhealthy Working Condition, on the entrance to the range. (RAC 2) [29 CFR 1919.1025(h), NGR 385-10 and AR 385-10]

3) For conversion of the range to other uses, such as storage, follow the guidance in NG PAM 385-16. (No RAC Assigned)

4) Do not allow firing on the Westminster IFR unless the range has been retrofitted to meet current requirements. (RAC 3) [NGR 384-15, Chapter 43-2c]

5) A re-evaluation of the range, to include air sampling, must be accomplished prior to opening the range for firing and biennially thereafter. (No RAC assigned) [NGR 384-15, Chapter 4]

APPENDIX A

REFERENCES

1. Department of Defense Instruction 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, October 1984.

2. TB MED 503, Occupational and Environmental Health, The Army Industrial Hygiene Program, February 1985.

3. NGR 385-15, Policy, Responsibilities, and Procedures for Inspection/Evaluation and Use of ARNG Indoor Firing Ranges, 30 March 1990.

4. NG Pam (AR) 385-16/ANGPAM 91-101, Guidelines for Converting Indoor Firing Ranges to Other Uses.

5. NGB Design Guide (DG) 425-1, Design Guide for Armories, 1 June 1997.

6. HQDA LTR 385-93-1, Inspection and Evaluation of U.S. Army Indoor Firing Ranges, 26 March 1993.

7. Occupational Safety and Health Administration (OSHA) Code of Federal Regulations (CFR), Title 29, Part 1910.1025, 1998 edition, Government Printing Office.

8. National Institute of Occupational Safety and Health (NIOSH) Technical Information, December 1975, subject: Lead Exposure and Design Considerations for Indoor Firing Ranges.

APPENDIX B
DERIVING RISK ASSESSMENT CODES (RACs)
FOR HEALTH HAZARDS
(Ref: DOD Instruction 6055.1)

STEP 1. 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

		Exposure Conditions			
		<CT	Occasionally - >CT Always - <STD	>CT ≤STD	>STD
AER	NO	0	3	5	7
POSSIBLE?	YES	1-2	4	6	8

AER = Alternate exposure route, such as skin absorption, ingestion
CT = DoD component threshold that triggers surveillance actions, such as microWatts/cm^2, dB, \ parts per million
STD = 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, nonsevere 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. Using the following guides to assess points, determine the mishap probability category (MPC) for health hazards. The probability of mishap reflects the duration of exposure and the number of exposed personnel.

A. Duration of Exposure Points Assessed

		Length of Exposure		
		1-8 hr/wk	>8 hr/wk not continuous	continuous
Type of Exposure	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
to 49	5-6
>49	7-8

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

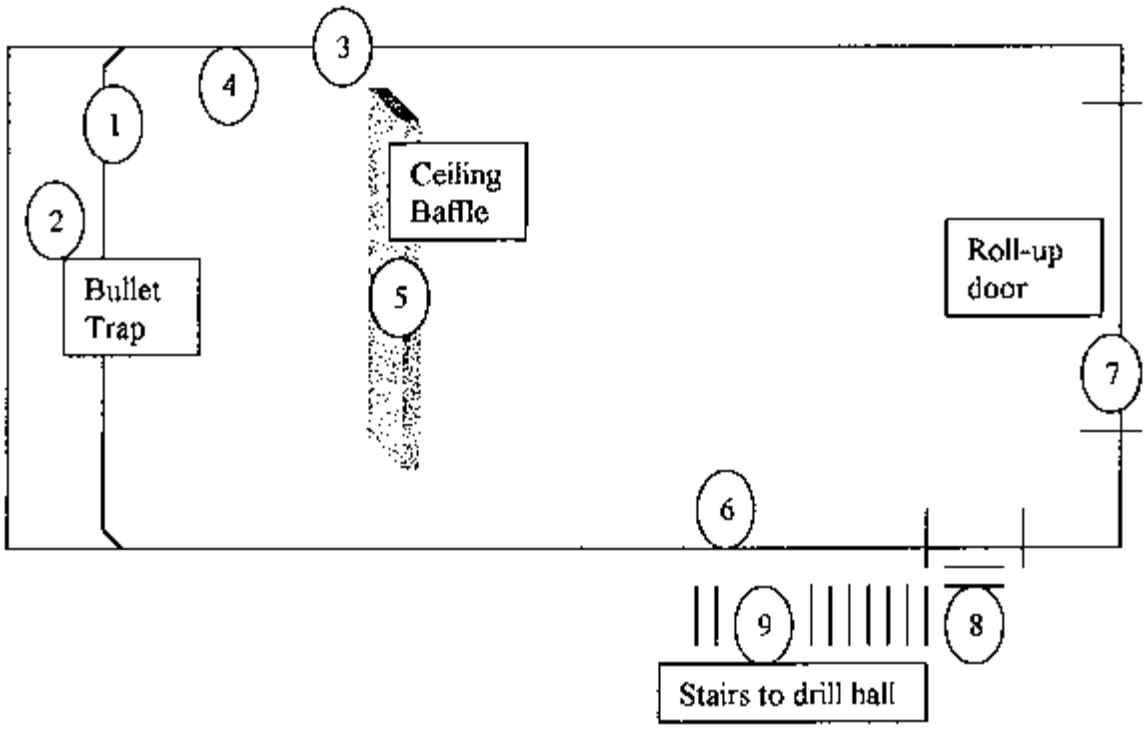
Total Points (sum of A and B, above)	MPC
14-16	A
10-13	B
5-9	C
<5	D

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

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

APPENDIX C

INDOOR FIRING RANGE WIPE SAMPLE LOCATIONS



WIPE SAMPLE RESULTS

SAMPLE NO.	LOCATION	Reported Results (µg/sample)	Converted Results* (µg/ft²)
1	Front plate of bullet trap	250	2250
2	Center of bullet trap	14,000	126,000
3	3 ft up on wall opposite entrance, 2/3 downrange	52	468
4	Floor in front of the bullet trap	270	2430
5	Baffle closest to bullet trap	53	477
6	Floor near entrance to IFR	26	234
7	3 ft up on roll-up door	24	216
8	Floor on landing outside IFR	150	1350
9	Mid-way up stairs outside range	35	325

* Samples were taken of 4 in. x 4 in. (16 in²) area
µg/sample – micrograms per wipe sample
µg/ft² - micrograms per square foot

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APPENDIX D

WIPE SAMPLE ANALYTICAL REPORT

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

01289915464315

Date JAN 29 1999
Laboratory Group Name 99I-0164-01
Account No. 07003

National Guard Bureau
Attention: Non-Responsive
Attn: NGB-AVN-SI
301-IH Old Bay Lane
Havre de Grace, MD 21078

FAX (410) 942-0254
Telephone (410) 942-0273

Sampling Collection and Shipment

Sampling Site VT ARNG Date of Collection January 12, 1999

Date Samples Received at Laboratory January 26, 1999

Analysis

Method of Analysis NMAM 7082

Date(s) of Analysis January 28, 1999

Analytical Results

Field Sample Number	Laboratory Number	Sample Type	Lead µg/sample								
01	99I00947	WIPE	250								
02	99I00948	WIPE	14000								
03	99I00949	WIPE	52.								
04	99I00950	WIPE	270								
05	99I00951	WIPE	53.								
06	99I00952	WIPE	26.								
07	99I00953	WIPE	24.								
08	99I00954	WIPE	150								
09	99I00955	WIPE	35.								
10	99I00956	WIPE	5.3								
Limit of Detection			3.								

† See comment on last page.
ND Parameter not detected above LOD.
NR Parameter not requested.

** See comment on last page.
( ) Parameter between LOD and LOQ.

Non-Responsive

Ana[redacted]

Rev[redacted]

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

Form ARF-C

01289915464315

Date JAN 29 1999
Laboratory Group Name 99I-0164-01

General Set Comments

Method Reference: NIOSH Manual of Analytical Methods (NMAM), Fourth Edition, 8/15/1994.
The following samples were diluted as indicated:
5X: 99I00947.
10X: 99I00950.
100X: 99I00948.

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547 / (801) 266-7700
FAX (801) 268-9992

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Bennington Readiness Center – Bennington, Vermont

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

19 February 2004

National Guard Armory
Bennington Readiness Center – Bennington, Vermont

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

19 February 2004

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

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List of Appendices

Executive Summary

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Bennington Readiness Center in Bennington, Vermont. Non-Responsive performed the evaluation on 04 August 2003 and 10 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 Range
- 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
- Suspected Asbestos Containing Material
- Housekeeping
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources

- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed a concentration above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall. 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.
- Peeling paint was observed in the men's shower room and second floor bathroom, and bulk sampling results revealed this paint to be a lead-based paint. Anyone who may perform repair and/or maintenance activities on these surfaces should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be taken.
- Water damage was observed at several locations at the armory. The source of the water damage was likely from roof leaks or condensation and humidity. The source of the water should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Visual mold was observed in the armory in the men's shower room and wooden floors on the first floor. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source.
- Interviews with employees revealed a musky odor (possibly mold) as an indoor air quality concern at the armory, specifically in the rooms on the first floor with wooden floors. The musky odor is accompanied by a discoloration (possibly mold bloom) in the wooden floors. The staff has experienced nausea and stomach problems when the odor and wood discoloration is present. A comprehensive indoor air quality investigation, with atmospheric sampling for mold, should be conducted to determine the extent of the potential mold problem.
- Interviews with 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.
- Indoor air quality measurements revealed that the humidity and temperature at the armory exceeded the recommended levels. Since there is no HVAC system at the

armory, it is recommended that a dehumidification system be installed at the armory. In addition, a fan can be used for cooling purposes and to circulate air in the armory.

- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in some areas; therefore consideration should be given to providing more lighting in these areas. 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.
- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at four of the locations sampled. These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Bennington Readiness Center in Bennington, Vermont Non-Responsive performed the evaluation on 04 August 2003 and 10 October 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 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 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/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 hall. If there were any positive results from the drill floor/assembly hall, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$).

Wipe sampling for lead revealed a concentration above a level of 40 $\mu g/ft^2$ collected from the soda machine top surface in the assembly hall. 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 for Lead

Breathing zone air sampling was conducted on one (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 and in the general area of the converted firing range: therefore, no actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed at in many locations in the armory. Peeling paint was observed in the men's shower room ceiling, first floor office (office left of entrance), III/V Team Office, two bathrooms on the second floor, and the stairwell between the 1st and 2nd floor. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Bulk sampling results revealed lead at concentrations exceeding 0.5 percent by weight at 2 locations. The lead concentration of the paint sample collected from the men's shower room ceiling was 19.0 percent by weight. The lead concentration of the paint sample taken from the ceiling in the second floor bathroom was 3.6 percent by weight. Both ceilings were constructed with similar material. In addition, the ceiling above the stairwell between the first and second floor and the women's bathroom on the second floor have some cracks and is appears to be the same material as the men's shower room and 2nd floor bathrooms. The results of the sampling are provided in Table 3.

Anyone who may perform repair and/or maintenance activities on surfaces coated with lead-based paint should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be 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 not observed.

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. Water damage and mold were observed at the armory. Water damage was observed on the men's shower room ceiling, men's latrine pipes, III/V Team Office ceiling and wall, and first floor office (first office left of the entrance) wall. The source of the water damage in the men's shower room was likely from a pipe leak or humidity and condensation. A water leak in the roof above the III/V Team Office was likely the source of water damage to both the III/V Team office and the office directly below it (first office left of the entrance). The sources of the water damage should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

Mold was observed in the men's shower room ceiling and in the wooden floors of the first floor offices (SFC Non-Responsive Office and the Administrative Office). The source of the mold in the men's shower room is likely from the humidity and condensation. The source of the mold in the wooden floors is undetermined. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate it.

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 and observation of work activities revealed that there are ergonomic concerns at the armory. The supply SGT indicated that he experienced "tingling of hands", a common symptom of a musculoskeletal disorder, and suffers from back pain, possibly due to the chair. The 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 revealed a musky odor (possibly mold) as an indoor air quality concern at the armory, specifically in the rooms on the first floor with wooden floors (SFC Non-Responsive Office and the Administrative Office). The musky odor is accompanied by a discoloration (possibly mold bloom) in the wooden floors. The staff has experienced nausea and stomach problems when the odor and wood discoloration is present. A comprehensive indoor air quality investigation, with atmospheric sampling for mold, should be conducted to determine the extent of the potential mold problem.

Measurements for humidity revealed that levels exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. ASHRAE also 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. The temperature on the first and second floor exceeded the acceptable range. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, a fan can be used for cooling purposes and to circulate air in 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 HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 some areas, including the kitchen, garage/storage room, and the office opposite of SFC Non-Responsive Office.

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 converted range. The space was converted into a supply room and office. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- floor outside the range at 240 micrograms lead per square foot ($\mu g/ft^2$);
- floor at 710 $\mu g/ft^2$;
- stored item, shelf top in the supply room area at < 110 $\mu g/ft^2$;
- overhead heaters at 1500 $\mu g/ft^2$;
- light fixture at 490 $\mu g/ft^2$; and
- stored item, desktop in the supply office area at < 110 $\mu g/ft^2$.

The lead levels at these locations were above 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). These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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, suspected asbestos-containing material, housekeeping, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, peeling lead-based paint, water damage, visual mold, indoor air quality, ergonomic conditions, surface lead contamination in the converted firing range, 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
Bennington, Vermont
Dates of Sampling: 04 August 2003 and 10 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTBEN216-1	Drill Floor - On Floor (See Building Layout - Appendix B)	< 110
VTBEN216-2	Drill Floor – On Floor (See Building Layout - Appendix B)	< 110
VTBEN216-3	Drill Floor – On Floor (See Building Layout - Appendix B)	< 110
VTBEN216-4	Drill Floor – On Floor (See Building Layout - Appendix B)	< 110
VTBEN216-5	Drill Floor – On Floor (See Building Layout Appendix B)	< 110
VTBEN216-6	Field Blank	< 12 µg
VTBEN284-1	Assembly Room – soda machine top surface (See Building Layout – Appendix B)	110
VTBEN284-2	Assembly Room – stereo system top surface (See Building Layout - Appendix B)	21
VTBEN284-3	Assembly Room - television top surface (See Building Layout - Appendix B)	7.6
VTBEN284-4	Assembly Room - windowsill (See Building Layout - Appendix B)	21
VTBEN284-5	Assembly Room – candy machine top surface (See Building Layout - Appendix B)	25
VTBEN284-6	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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Bennington, Vermont
Date of Sampling: 04 August 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTBEN216-A1	Non-Responsive	0814-1056/162	2.486	402.71	< 0.002
VTBEN216-A2		0812-1055/163	2.483	404.73	< 0.002
VTBEN216-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
Bennington, Vermont
Date of Sampling: 04 August 2003

Sample Number	Location	Results, % By Weight
VTBEN216-B1	Basement-men's shower room (2)-ceilings	19.0
VTBEN216-B2	1st floor-1st office left of entrance-wall	0.40
VTBEN216-B3	2nd floor-III/V Team Office-wall/ceiling	0.44
VTBEN216-B4	2nd floor-bathroom (left of stairwell)-ceiling	3.6
VTBEN216-B5	1st floor Non-Responsive Office-door	0.24

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
Bennington, Vermont
Date of Sampling: 04 August 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor -- copier room	1	545	74.2	80.1
2nd Floor - foyer	1	570	64.8	81.1
Basement - classroom	1	602	71.4	72.7
Outdoors	1	448	78.7	78.6

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.

Table 5

Illumination Readings

National Guard Armory

Bennington, Vermont

Date of Sampling: 04 August 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Basement-Classroom	19.4-78.7	70	Some areas
Basement-Kitchen	14.2-67.6	70	No
Basement-Maintenance Office	20.1-75.6	70	Some areas
Basement-Garage/Storage	3.9-19.3	30	No
Basement-Converted Firing Range Supply Office Area	28.5-78.3	70	Some areas
Basement-Converted Firing Range Supply Storage Area	11.2-58.4	30	Some areas
Men's Latrine	5.4-72.3	40	Some areas
1st Floor Non-Responsive Office	40.1-74.3	70	Some areas
1st Floor-Copier Room	19.1-75.3	70	Some areas
1st Floor-Office (opposite Non-Responsive office)	17.1-60.1	70	No
Stairwell to 2nd Floor	8.7-54.3	7.5	Yes
2nd Floor-Office (above Non-Responsive office)	31.3-71.6	70	Some areas
2nd Floor-Bathroom	34.2-64.3	40	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 ANSI/IES RP-1 and RP-7.

Table 6

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Bennington, Vermont

Date of Sampling: 04 August 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTBEN216-7	Floor Outside the Range	240
VTBEN216-8	Floor	710
VTBEN216-9	Stored Item – shelf top	< 110
VTBEN216-10	Overhead heaters	1500
VTBEN216-11	Light Fixture	490
VTBEN216-12	Field Blank	< 12 µg
VTBEN216-13	Stored Item – desktop (office area)	< 110

[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.

Appendix A
HHIM Data Form(s)

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

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

SECTION 1. DEMOGRAPHIC DATA

RLOC	INSTALLATION: Bennington Armory Vermont ARNG	BLDG/RM NO.: Bennington
OCATION/CODE: Administrative Areas / AA	OPERATION/CODE: Administrative OP/ADO	
URVEY DATE: 04 August 2003	EVALUATOR (Initials): MS.	
AACOM/CODE: Army National Guard	SUBMACOM/CODE: XX	SUPERVISOR: Non-Responsive SFC
ELEPHONE/DSN NO.: 802-447-2795	UNIT/ORGANIZATION: Company C 2nd. BN 172d. Armor	RAC: 4 / FREQUENCY (hrs/day): 8
IO. CIV(S): 1	NO. MIL: 4	NO. CONTRACTOR(S): 0 / NO. LOC(S): 0 / NO.OTHER: 0

SECTION 2. FACILITY DATA

AB 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
ACID		
COLD SURFACES		
HOT SURFACES		
NBC AGENTS		
OIL		
SOLVENTS		
SURGICAL GLOVES		

RESPIRATOR	NIOSH TC NO.	MANUFACTURER	R	U
AIRLINE				
ABRASIVE BLASTING HOOD				
DISPOSABLE				
FULL FACE AIR PURIFYING				
1/2 FACE AIR PURIFYING				
POWERED AIR PURIFYING				
1/4 FACE AIR PURIFYING				
SELF CONTAINED				

EYES/FACE	R	U
CHEMICAL SPLASH		
FULL FACE SHIELD		
CHEMICAL/SAFETY		
SAFETY/IMPACT		
WELDING HELMET		

HEARING	R	U
CANAL CAPS		
EAR PLUGS		
HELMETS		
MUFFS		
MUFF/EARPLUG COMBO		
MUFF/EARPLUG W/TIME LIMIT		

BODY	R	U
APRONS		
COLD WEATHER CLOTHING		
COVERALLS		
FULL BODY SUIT		
HEAT REFLECTIVE VEST/SUIT		
SAFETY BELT/HARNESS		

HEAD/FIT	R	U
COLD WEATHER BOOTS/HATS		
HARD HATS		
IMPERMEABLE BOOTS		
SAFETY/CONDUCTIVE SHOES		
SAFETY/NON-CONDUCTIVE SHOES		

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 and fumes, as Pb	2-moderate	C Uncontrolled Respiratory
POHEATSTR	Heat Stress	3-low	D Uncontrolled Physical

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive			M	Non-Responsive	M/L
		W			
					CIV

SECTION 6. COMMENTS

___No comments ___See attached sheet

Survey conducted by Michele Seman: Building contains 4 military full-time staff and 1 civilian custodian, full-time staff performs mainly administrative functions. In addition, please note mold is a concern at the armory, specifically on the first floor and basement.

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.

DEPARTMENT OF THE ARMY
CO C 2nd BN 172d ARMOR
National Guard Armory, 100 Franklin Lane
Bennington, Vermont 05201

4 August 2003

WPXFCO

MEMORANDUM FOR RECORD

SUBJECT: Industrial Hygiene Inspection

1. The following personnel are full time members of the Vermont National Guard workforce located at the State Armory in Bennington, Vermont:

NAME:	RANK:
Non-Responsive	SSG
	Custodian
	SFC
	MSG
	SFC
	SSG

2. POC for this matter is the undersigned at (802)447-2795.

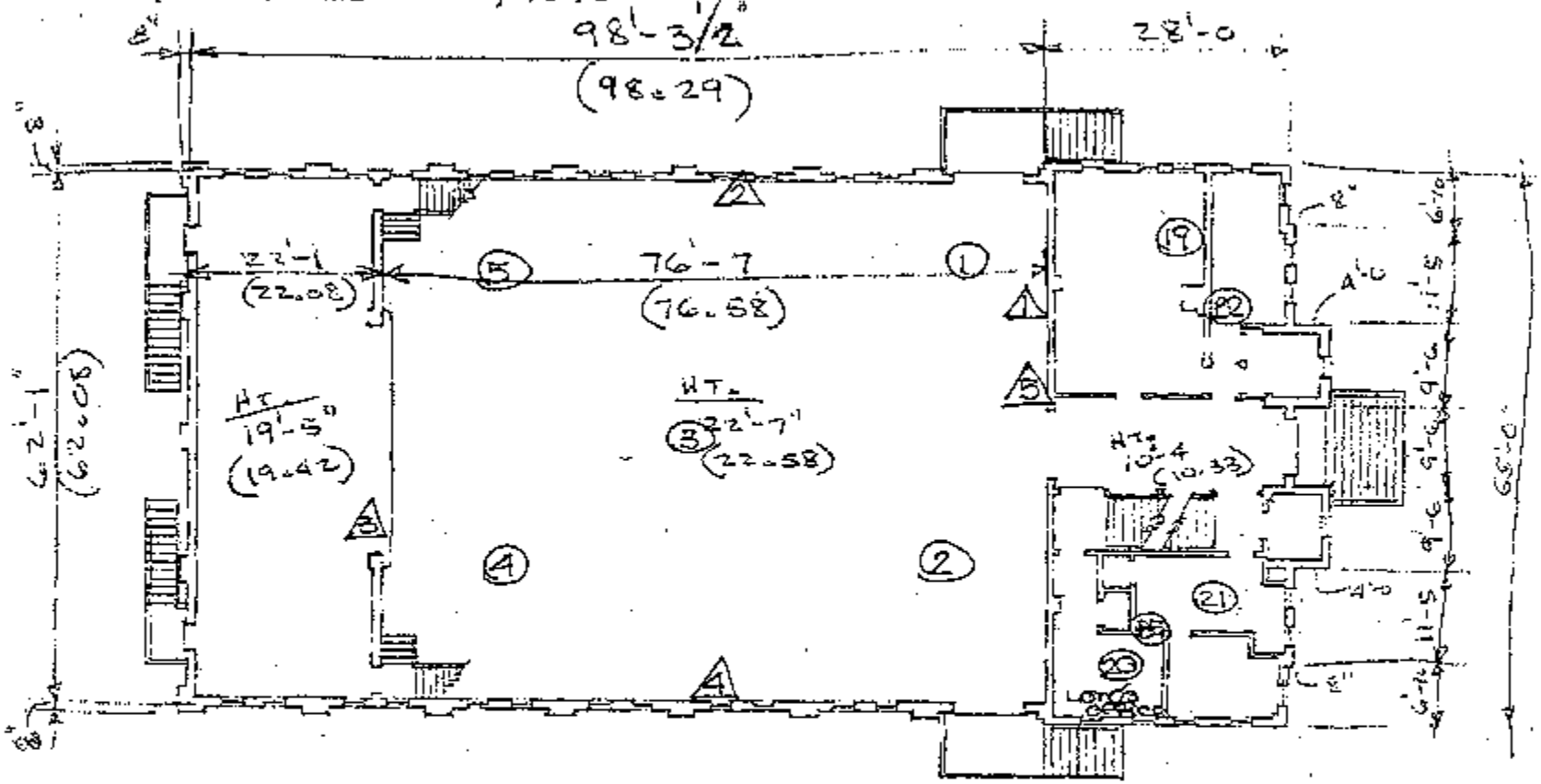
FOR THE COMMANDER:

Non-Responsive

SFC, VTARNG
Readiness NCO

Appendix B
Building Layout

62.08 × 22.08 × 19.42 = 26,619.51 CF.
76.58 × 62.08 × 22.58 = 107,347.27 CF.
65.0 × 28.0 × 10.33 = 18,800.60 CR.
51.33 × 0.67 × 10.33 = 355.26 CF.
9.5 × 4.0 × 10.33 × 2 = 785.08 CR.
1ST FL. TOTAL = 153,907.72 SF.



98.29 × 62.08 = 6101.84 SF.
65.00 × 28.00 = 1820.00 SF.
51.33 × 0.67 = 34.39 SF.
4.0 × 9.5 × 2 = 76.00 SF.
1ST FL. TOTAL = 8032.23 SF.

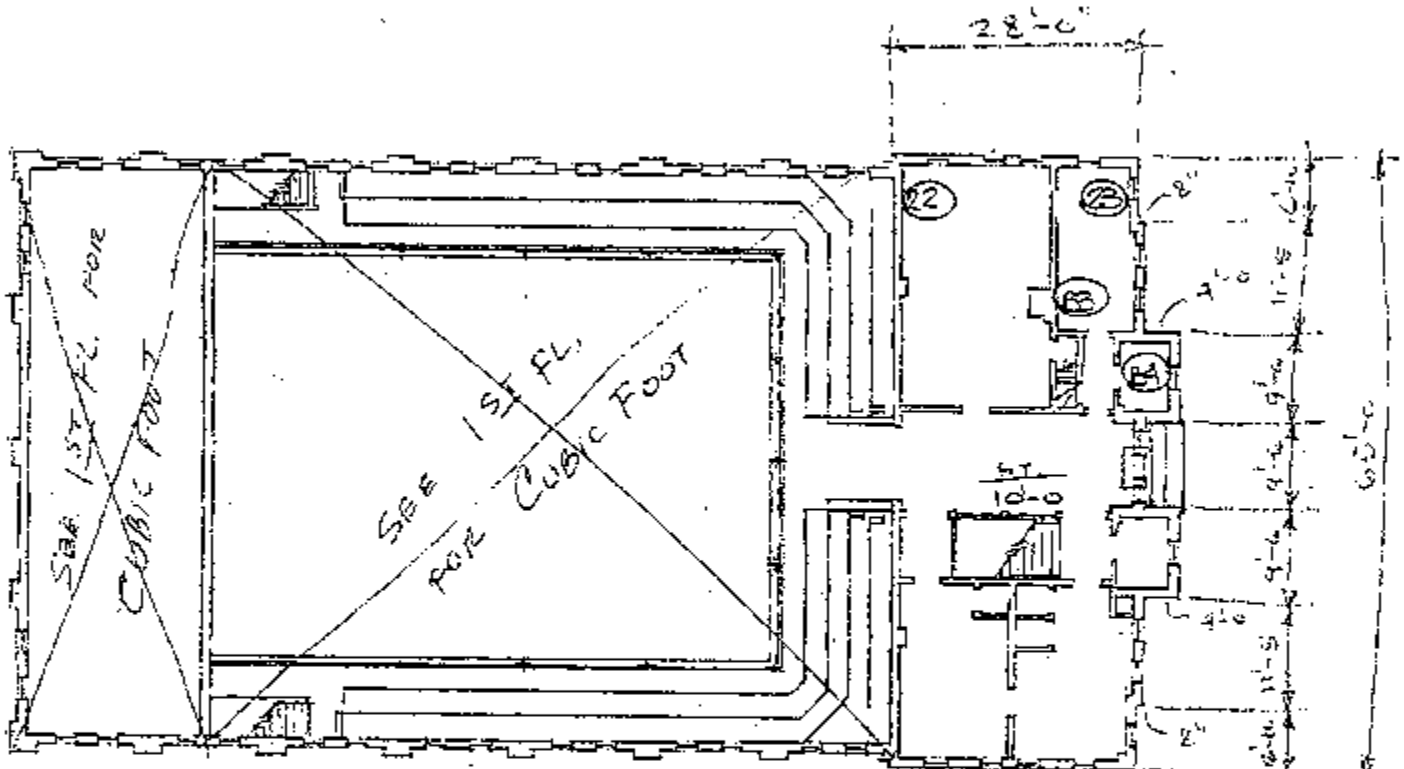
○ Sample date: 04 August 2003
△ Sample date: 10 October 2003

- SPACE CRITERIA -

1ST FLOOR PLAN	
BENNINGTON ARMORY	
SCALE: 1" = 20'	26/NOV./80

65.0 x 28.0 x 10.0 = 18,200 cf.
51.33 x 0.67 x 10.0 = 343.91 cf.
9.5 x 4.0 x 10.0 x 2 = 760.00 cf.

2ND FL. TOTAL = 19,303.91 cf.

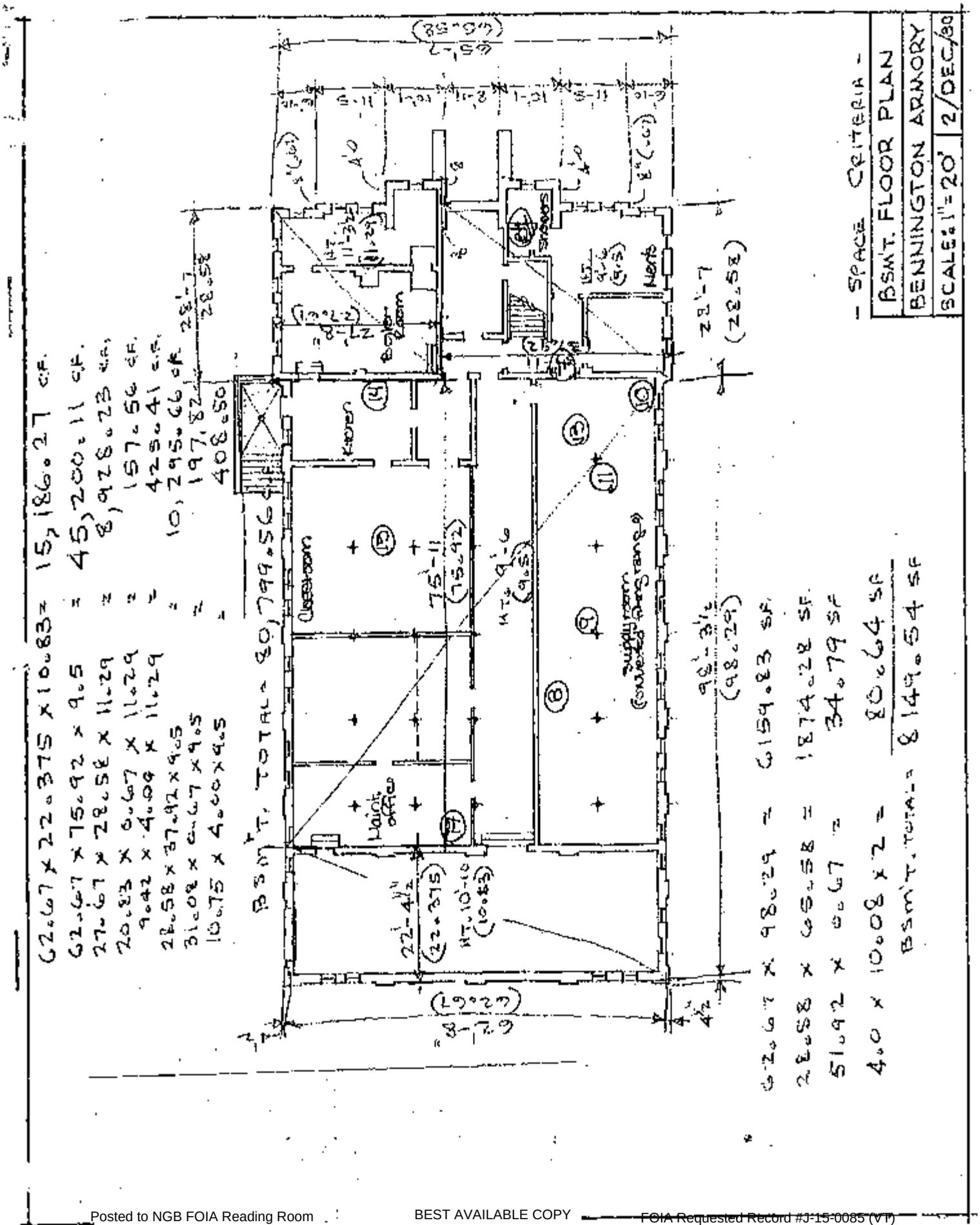


65.0 x 28.0 = 1820.00 sf.
51.33 x 0.67 = 34.39 sf.
9.5 x 4.0 x 2 = 76.00 sf.

2ND FL. TOTAL = 1930.39 sf.

- SPACE CRITERIA -

2ND FLOOR PLAN
BENNINGTON ARMORY
SCALE: 1" = 20' | 5/DEC/30



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:**	VTBEN216	**Chain Of Custody:**	115913
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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
0362242	VTBEN216-1	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362243	VTBEN216-2	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362244	VTBEN216-3	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362245	VTBEN216-4	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362246	VTBEN216-5	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362247	VTBEN216-6	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362248	VTBEN216-7	Flame	Wipe	****	0.111	108.00	ug/ft²		240	ug/ft²	
0362249	VTBEN216-8	Flame	Wipe	****	0.111	108.00	ug/ft²		710	ug/ft²	
0362250	VTBEN216-9	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362251	VTBEN216-10	Flame	Wipe	****	0.111	108.00	ug/ft²		1500	ug/ft²	
0362252	VTBEN216-11	Flame	Wipe	****	0.111	108.00	ug/ft²		490	ug/ft²	
0362253	VTBEN216-12	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362254	VTBEN216-13	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	

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

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTBEN216	**Chain Of Custody:**	115913
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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

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]

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTBEN284	**Chain Of Custody:**	118722
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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
0402941	VTBEN284 -1	Furnace	Wipe	****	0.111	27.00	ug/ft²	110	ug/ft²	
0402942	VTBEN284 -2	Furnace	Wipe	****	0.111	2.70	ug/ft²	21	ug/ft²	
0402943	VTBEN284 -3	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.6	ug/ft²	
0402944	VTBEN284 -4	Furnace	Wipe	****	0.111	2.70	ug/ft²	21	ug/ft²	
0402945	VTBEN284 -5	Furnace	Wipe	****	0.111	2.70	ug/ft²	25	ug/ft²	
0402946	VTBEN284 -6	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]

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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTBEN216-B1 through VTRUT217-B6
P.O. No.:	Not Available
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3834
DCL Sample ID No.:	03-23432 through 03-23448
Sample Receipt Date:	8/8/2003
Preparation Date:	8/8/2003
Analysis Date:	8/12/2003

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
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 #	mg/Kg (ppm)	% by weight
VTBEN216-B1	03-23432	190000.	19.
VTBEN216-B2	03-23433	4000.	0.40
VTBEN216-B3	03-23434	4400.	0.44
VTBEN216-B4	03-23435	36000.	3.6
VTBEN216-B5	03-23436	2400.	0.24
VTWES216-B1	03-23439	35.	0.0035
VTRUT217-B1	03-23443	1600.	0.16
VTRUT217-B2	03-23444	440.	0.044
VTRUT217-B3	03-23445	5800.	0.58
VTRUT217-B4	03-23446	97000.	9.7
VTRUT217-B5	03-23447	53000.	5.3
VTRUT217-B6	03-23448	8700.	0.87
	Prep Blank	ND	
% Recovery	LCS	93.	
% Recovery	23303MS	98.	
% Recovery	23303MSD	96.	
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, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTBEN216-A1 through VTRUT217-A3
P.O. No.:	Not Available
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3834
DCL Sample ID No.:	03-23429 through 03-23442
Sample Receipt Date:	8/8/2003
Preparation Date:	08/11/03
Analysis Date:	08/11/03

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
VTBEN216-A1	03-23429	402.71	ND	<0.002
VTBEN216-A2	03-23430	404.73	ND	<0.002
VTBEN216-A3	03-23431	0	ND	-
VTWES216-A1	03-23437	294.35	ND	<0.003
VTWES216-A2	03-23438	0	ND	-
VTRUT217-A1	03-23440	420.05	ND	<0.002
VTRUT217-A2	03-23441	412.99	ND	<0.002
VTRUT217-A3	03-23442	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		100.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** **BEN**
Date: 8/4/2002

Sample 1

Sample Number: VTBEN216-A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.525	2.444
	2.523	2.456
	2.515	2.458
	2.506	2.46
Average	**2.517**	**2.455**

Average Pre and Post **2.4859**

Time 1	8:14
Time 2	10:56
Total Time Sampled	**2:42**
Minutes Sampled	162.00

Volume **402.71 Liters**

Sample 2

Sample Number: VTBEN216-A2
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.517	2.436
	2.512	2.457
	2.518	2.446
	2.522	2.456
Average	**2.517**	**2.449**

Average Pre and Post **2.4830**

Time 1	8:12
Time 2	10:55
Total Time Sampled	**2:43**
Minutes Sampled	163.00

Volume **404.73 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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Bennington Readiness Center

100 Franklin Lane
Bennington, VT 05201

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 25, 2011

AEI Project #: 12685 4L VT Bennington RC

_____

Non-Responsive
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Bennington Readiness Center located at 100 Franklin Lane, Bennington VT 05201. Non-Responsive performed the evaluation on October 24, 2011. The point of contact for the facility was Non-Responsive . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in men's bathroom and shower located in the basement of the facility. A sample of the peeling paint was found to contain 0.19% lead by weight. The shower and bathroom paint chip sample would not be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5% by weight). Results of dust wipe samples collected from the former firing range and one sample from the window sill in the Drill Hall were above the recommended maximum levels for adult exposures with results ranging from 520 to 2500 µg/ft^2. All additional wipe samples collected from the facility were below the recommended maximum levels for adult exposures.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect asbestos-containing materials were observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection. However, staff at the facility indicated that a crack in the foundation in the Supply Room does lead to water intrusion during times of wet weather.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the Drill Hall and Stage/Weight Room. The illumination measurements indoors ranged from 17.7 foot candles (fc) to 148 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 610.9° F and 44.1% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program

be placed in every MSDS notebook. MSDSs for some new custodial products are required per OSHA 29 CFR 1910.1200.

Overall, the Bennington Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Bennington Readiness Center located at 100 Franklin Lane, Bennington VT 05201. Non-Responsive performed the evaluation on October 25, 2011. The point of contact for the facility was Non-Responsive . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Bennington Readiness Center was built in 1926. The readiness center is staffed by 8 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Bennington Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Bennington facility consist exclusively of supply and administrative duties. No other maintenance of vehicles or other physical tasks are performed at the facility. A small garage exists in the facility basement but it is only used for storage.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in men's bathroom and shower located in the basement of the facility. A paint chip samples were submitted to AMA Analytical Services, Inc. of Lanham, MD for lead analysis. The samples were found to contain 0.19% lead by weight. The shower and bathroom paint chip sample would not be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5% by weight). Certificates of analysis are included in Appendix B

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. Several wipe samples collected from the former firing range and one sample from the window sill in the Drill Hall were above the recommended maximum levels for adult exposures with results ranging from 520 to 2500 µg/ft^2. All additional wipe samples collected from the facility were below the recommended maximum levels for adult exposures. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 –Dust Wipe Sampling Data Sheet for VT ARNG Bennington Readiness Center on October 25, 2012.

Wipe Sample #	Wipe Sample Location	Lead Result (µg/ft^2)
BEN-01	Supply Room/ Former Indoor Firing Range, Former bullet trap	<110
BEN-02	Supply Room/ Former Indoor Firing Range, Light fixture	**590**
BEN-03	Supply Room/ Former Indoor Firing Range, Overhead Heater	**520**
BEN-04	Supply Room/ Former Indoor Firing Range, Stored totes	<110
BEN-05	Supply Room/ Former Indoor Firing Range, Floor	**2,500**
BEN-06	Supply Room/ Former Indoor Firing Range, Floor immediately outside	**530**
BEN-07	Supply Office, Work station	<110

Table 1 –Dust Wipe Sampling Data Sheet for VT ARNG Bennington Readiness Center on October 25, 2012.

Wipe Sample #	Wipe Sample Location	Lead Result (µg/ft²)
BEN-08	Kitchen, Counter	<110
BEN-09	Drill Hall, Table	<110
BEN-10	Drill Hall, Middle of floor	<110
BEN-11	Drill Hall, Window sill	**580**
BEN-12	Room 12, Supply vent	<110
BEN-13	Stage, Middle of stage	<110
BEN-14	Room 14, Top of cabinet	<110
BEN-15	Room 23, Middle of Entry floor	<110
BEN-16	Break Room, Table	<110
BEN-17	Room 19, Window Sill	<110

*The recommended maximum level for adult exposures is 200 µg/ft² lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect asbestos-containing materials were observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection. However, staff at the facility indicated that a crack in the foundation in the Supply Room does lead to water intrusion during times of wet weather.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 17.7 foot candles (fc) to 148 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7575x, factory calibrated in July, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 62.8 to 73.3° F and 39.9 to 62.0% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 61.9° F and 44.1% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 458 to 851 parts per million (ppm). Outdoor CO_2 levels were 492 ppm. CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.5 to 1.1 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new custodial products are required per OSHA 29 CFR 1910.1200.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, the presence of damaged suspect asbestos-containing materials, water intrusion, peeling lead-based paint, noise hazards, visible mold and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: accumulated lead-containing dust, the hazard communication program and lighting. Overall, the Bennington Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

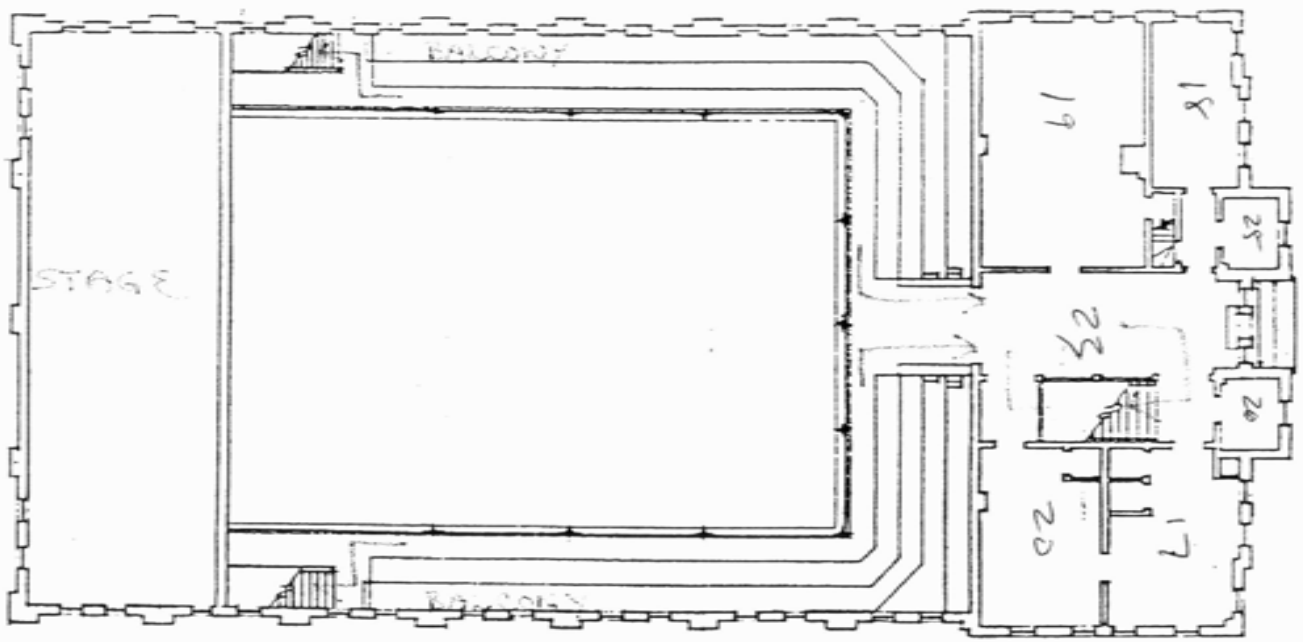
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.

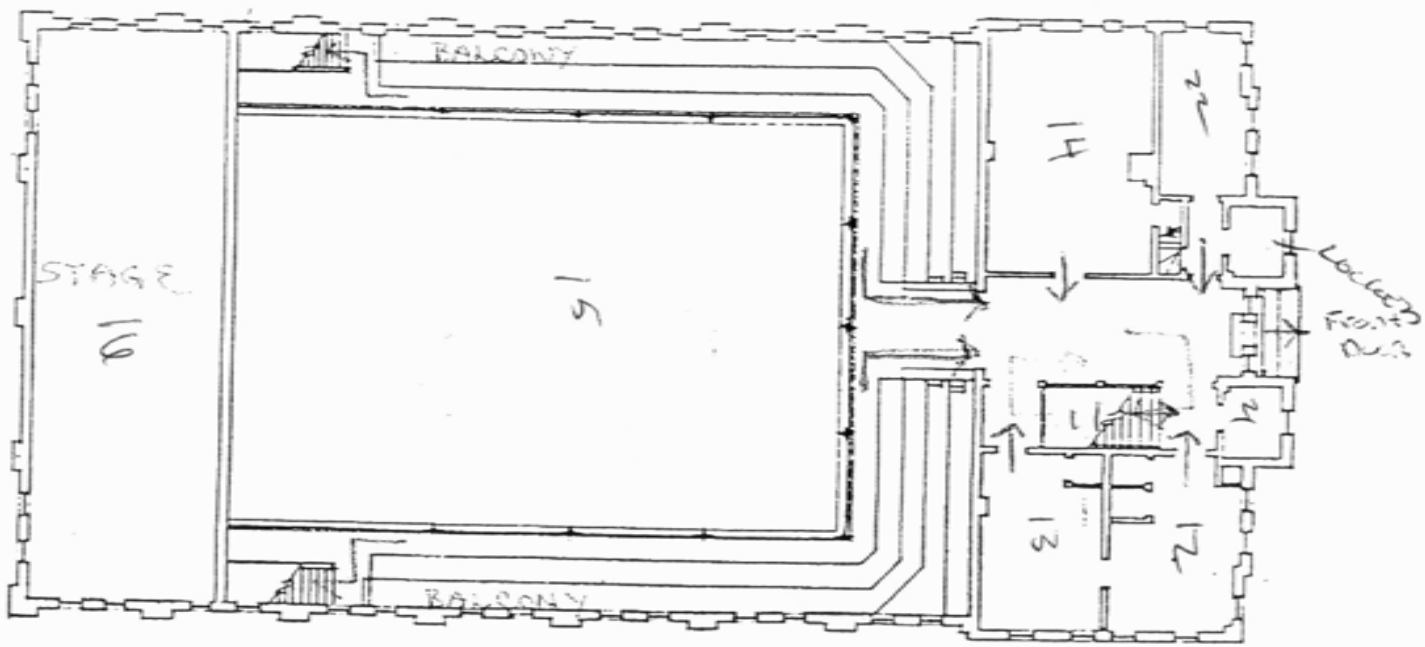
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout



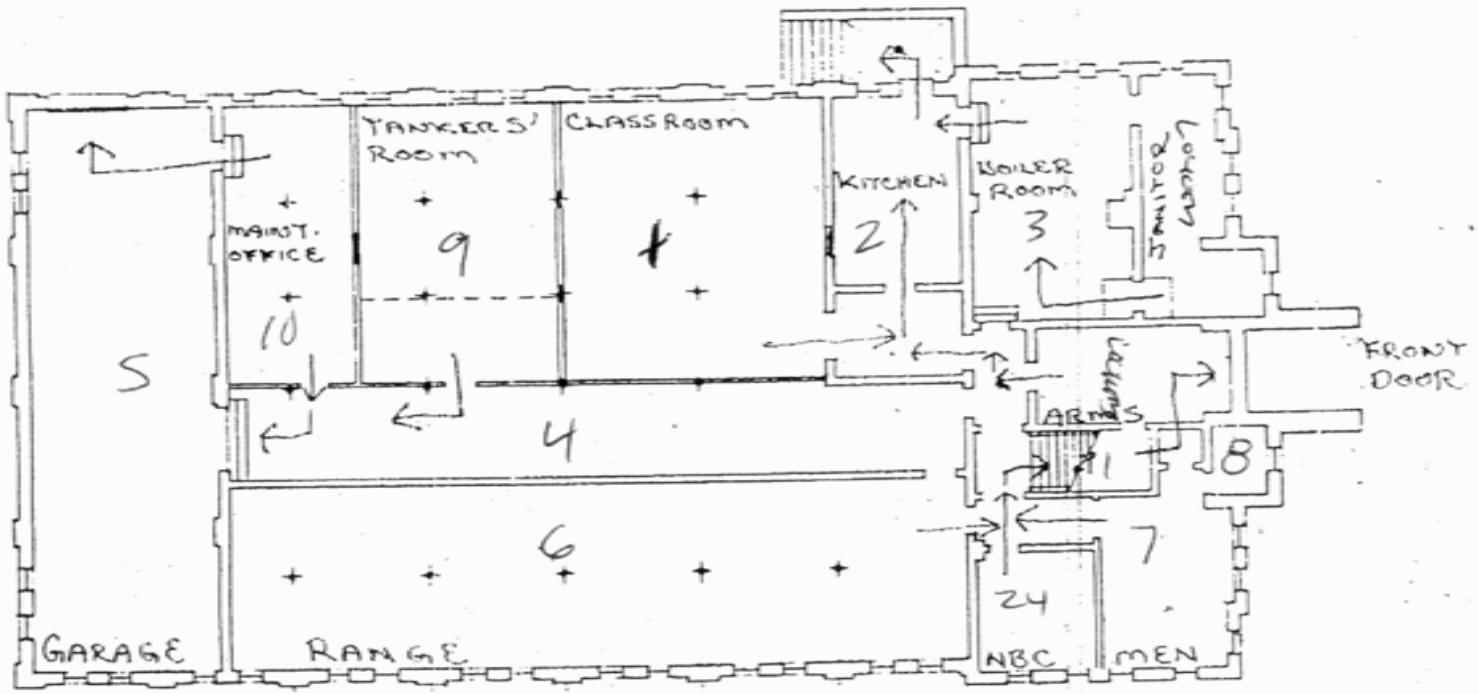
2ND FLOOR PLAN
BENNINGTON ARMORY
SCALE: 1" = 20' | 5/DEC./80

EMERGENCY EXIT



1ST FLOOR PLAN
BENNINGTON ARMORY
SCALE: 1" = 20' | 5/DEC./80

EMERGENCY EVACUATION



BSM'T. FLOOR PLAN
BENNINGTON ARMORY
SCALE: 1" = 20' | 2/DEC/8

EMERGENCY EVACUATION

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	Bennington RC	**Chain Of Custody:**	514392
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Bennington, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	12685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2012 **Report Date:** 11/9/2012

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
13011040	BEN-1	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011041	BEN-2	Flame	Wipe	****	0.108	110	ug/ft²	64	590	ug/ft²	
13011042	BEN-3	Flame	Wipe	****	0.108	110	ug/ft²	56	520	ug/ft²	
13011043	BEN-4	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011044	BEN-5	Flame	Wipe	****	0.108	110	ug/ft²	270	2500	ug/ft²	
13011045	BEN-6	Flame	Wipe	****	0.108	110	ug/ft²	57	530	ug/ft²	
13011046	BEN-7	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011047	BEN-8	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011048	BEN-9	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011049	BEN-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011050	BEN-11	Flame	Wipe	****	0.108	110	ug/ft²	63	580	ug/ft²	
13011051	BEN-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011052	BEN-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011053	BEN-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011054	BEN-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011055	BEN-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011056	BEN-17	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13011057	BEN-18	Flame	Paint Chip	****	N/A	0.0086	%Pb		0.19	%Pb	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Bennington RC	**Chain Of Custody:**	514392
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Bennington, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	12685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2012 **Report Date:** 11/9/2012

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.

Analyst 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) 514392

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: BENNINGTON RC
2. Job Location: BENNINGTON, VT
3. Job #: 12685 P.O. #: W912K6-09-A-0003
4. Contact Person [redacted] @ phone #
5. Submitted by: [redacted] Signature: [redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER 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] @ariaenviro.com
Comments:	❑ 2 Day Date Due: 11/9/12	❑ Fax: [redacted] @us.army.mil
	❑ Results Required By Noon	❑ Verbals: [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)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ~~❑~~ Pb Paint Chip 1 (QTY)
- ☒ *Pb Dust Wipe (wipe type 6x6 ST) 17 (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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	SEE ATTACHED FIELD DATA SHEETS														

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: 11/2/12 @ Via: FedEx By (Print): [redacted] Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 7937 2722 0367

Aria Environmental, Inc.

Date Collected: October 25, 2012
Location: Bennington Readiness Center
Project No: [illegible]
Inspector: Non-Responsive

Table 1 –Dust Wipe Sampling Data Sheet for VT ARNG Bennington Readiness Center on October 25, 2012.

Wipe Sample #	Sample Location	Area
BEN-01	Supply Room/ Former Indoor Firing Range, Former bullet trap	10 cm x 10 cm
BEN-02	Supply Room/ Former Indoor Firing Range, Light fixture	10 cm x 10 cm
BEN-03	Supply Room/ Former Indoor Firing Range, Overhead Heater	10 cm x 10 cm
BEN-04	Supply Room/ Former Indoor Firing Range, Stored totes	10 cm x 10 cm
BEN-05	Supply Room/ Former Indoor Firing Range, Floor	10 cm x 10 cm
BEN-06	Supply Room/ Former Indoor Firing Range, Floor immediately outside	10 cm x 10 cm
BEN-07	Supply Office, Work station	10 cm x 10 cm
BEN-08	Kitchen, Counter	10 cm x 10 cm
BEN-09	Drill Hall, Table	10 cm x 10 cm
BEN-10	Drill Hall, Middle of floor	10 cm x 10 cm
BEN-11	Drill Hall, Window sill	10 cm x 10 cm
BEN-12	Room 12, Supply vent	10 cm x 10 cm
BEN-13	Stage, Middle of stage	10 cm x 10 cm
BEN-14	Room 14, Top of cabinet	10 cm x 10 cm
BEN-15	Room 23, Middle of Entry floor	10 cm x 10 cm
BEN-16	Break Room, Table	10 cm x 10 cm
BEN-17	Room 19, Window Sill	10 cm x 10 cm

BEN-18 PAINT CHIP SAMPLE FROM SHOWER

Appendix C
Photo Documentation

Bennington RC

Photo 1: Bennington RC Front Entrance

Photo 2: Storage Area

Photo 3: Storage Area

Photo 4: Storage Area

Bennington RC

Photo 5: Supply Room

Photo 6: Supply Room

Photo 7: Peeling Paint in Men's Basement Shower

Photo 8:Peeling Paint in Men's Basement Shower

Bennington RC

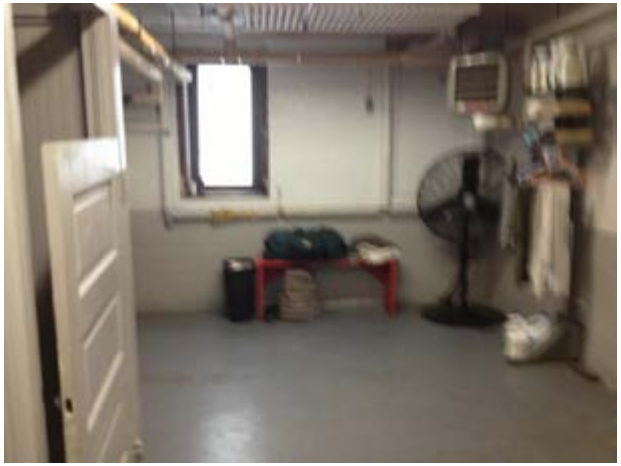


Photo 9: Men's Basement Restroom

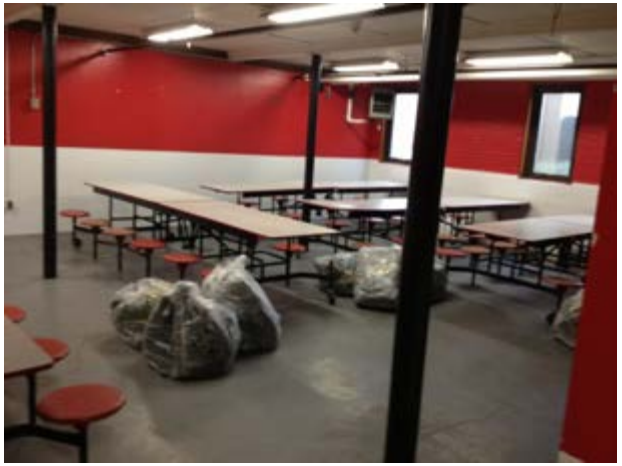


Photo 10: Break Room

Photo 11: Kitchen

Photo 12 Mechanical Room:

Bennington RC

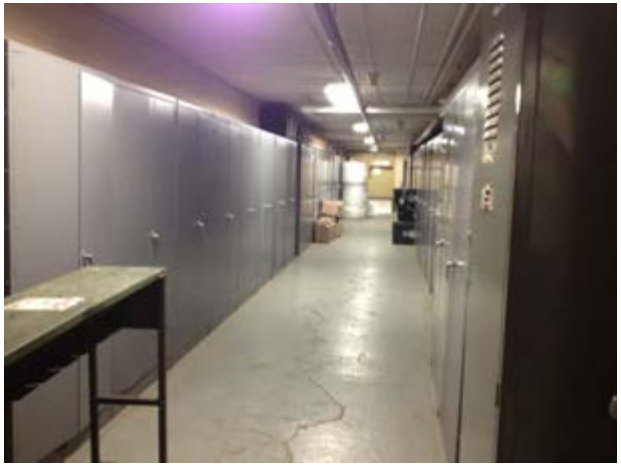


Photo 13: Basement Hallway to Garage

Photo 14: Office

Photo 15: Drill Hall and Stage

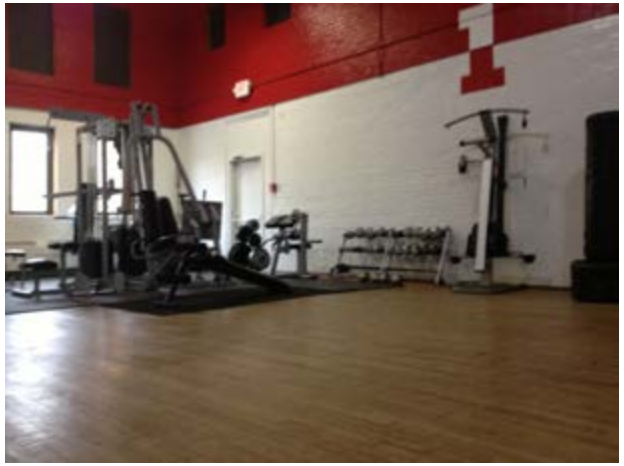


Photo 16: Stage

Bennington RC

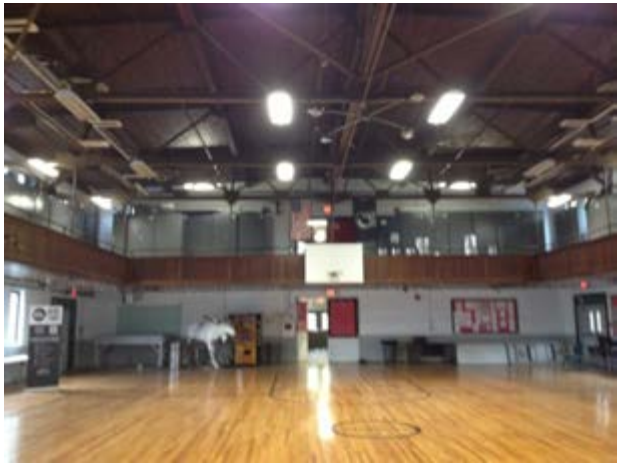


Photo 17: Drill Hall Balcony

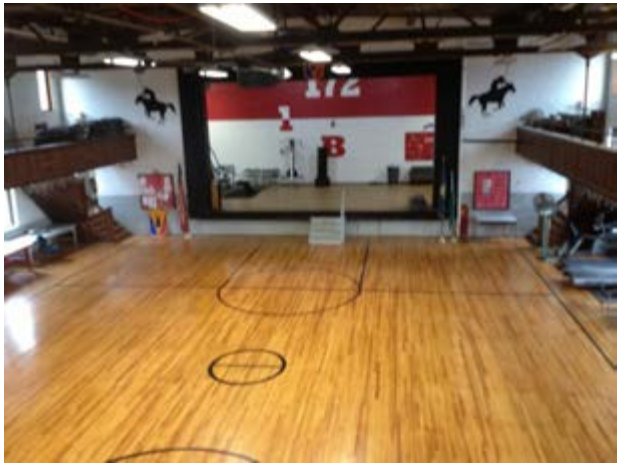


Photo 18: Drill Hall

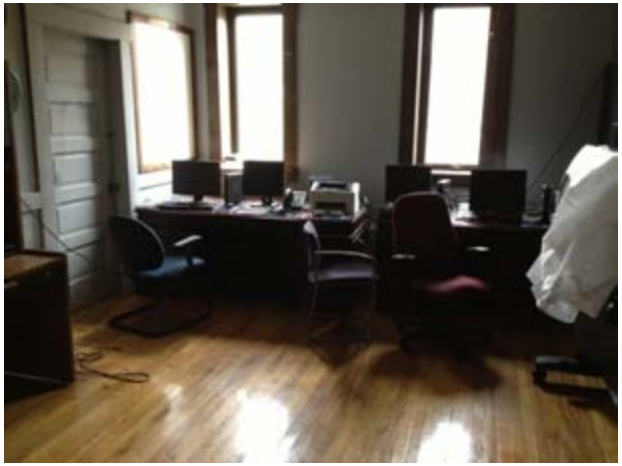


Photo 19: Computer Room

Photo 20: Bunk Room

Bennington RC

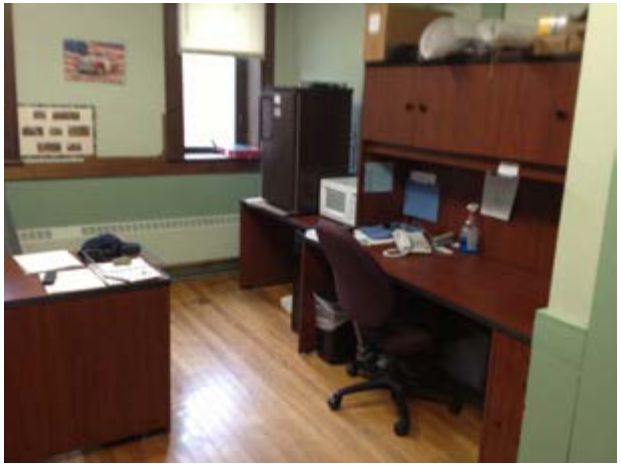


Photo 21: Office

Photo 22: Office

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Bennington	IAQ								Light		
Date	10/25/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Bennington RC			Serial Number		7575x1228011						Serial Number		4980243
Weather Conditions				Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
1	Classroom/Break Room			62.8	X	61.4	X	523		1.1		51.8		30-50
2	Kitchen			64.2	X	51.8		482		0.7		64.1		50
3	Boiler Room			65.9	X	49.8		474		0.6		32.9		30
4	Locker Room			68.2		51.0		517		0.7		144.7		7
5	Garage			68.4		40.3		523		1.0		28.8	X	30
6	Supply Room			72.6		50.2		745		0.9		109.9		30
7	Latrine			69.0		59.0		648		0.9		148.0		5
8	Janitor's Closet			68.9		62.0	X	677		0.9		53.9		30
9	Trainer's Storage			71.4		51.4		704		0.7		152.6		30
10	Maintenance Storage			70.9		46.9		583		0.9		105.5		30
11	Stairwell			70.3		47.5		596		0.6		140.1		5
12	Office			71.4		45.0		847		0.9		85.6		30-50
13	Office			71.6		45.0		851		0.9		96.8		30-50
14	Recruiters Office			72.2		44.1		669		0.9		86.3		30-50
15	Drill Hall			73.1		43.3		551		0.8		29.2	X	50
16	Stage/Weight Room			72.5		43.8		545		0.9		17.7	X	30
17	Office			69.6		50.4		699		0.6		120.6		30-50
18	Office			70.6		50.5		458		0.5		60.9		30-50
19	Bunk Room			72.3		46.4		658		0.6		38.5		5
20	Computer Room			72.6		44.8		616		0.6		57.8		30-50
21	Medic Room			73.0		42.7		741		0.8		28.6		30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Bennington	IAQ								Light		
Date	10/24/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Westminster RC			Serial Number		7575x1228011						Serial Number		4980243
Weather Conditions				Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficien	Illuminance Reference (fc)
22	Office			73.3		39.9		569		0.7		98.5		30-50
23	Entry Vest bule			73.2		43.7		728		1.1		75.0		10
24	Storage			71.6		49.7		793		0.7		105.3		30
25	Latrine			73.1		45.6		610		0.6		53.2		5
26	Latrine			72.9		46.1		612		0.6		54.6		5

Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Gosse Court/Moulton Readiness Center – Burlington, Vermont

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 May 2004

National Guard Armory
Gosse Court/Moulton Readiness Center – Burlington, Vermont

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 May 2004

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 Gosse Court/Moulton Readiness Center in Burlington, Vermont. Non-Responsive performed the evaluation on 21 July 2003 and 8 October 2003. The point of contact at the readiness center was SGT 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 Range
- 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
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns

- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at three locations (assembly hall, kitchen, and floor outside the firing range) in the armory. It is recommended that these surfaces and the areas immediately around these surfaces be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor and kitchen should be thoroughly cleaned.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall, kitchen, classroom, and floor outside the firing range. Areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.
- Materials (boiler room insulation and floor tiles) suspected of containing asbestos were observed. A bulk sample collected from the lobby floor revealed that the brown compact material did contain asbestos. An operations and maintenance plan should be followed when performing any activities that may disturb the asbestos-containing and suspected asbestos-containing materials.
- Indoor air quality measurements revealed that humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the latrines where there is a minimal fresh air supply. A fan can be used for circulating air in the latrines.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in some areas; therefore consideration should be given to providing more lighting in these areas. 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.

- There was not a converted firing range at the facility; however, there was an inactive indoor firing range. For informational purposes, wipe samples were taken for lead at various locations in or near the range. As expected, the results revealed lead at extremely high concentrations. This inactive firing range should not be used for any purposes, except as a firing range (if approved as a fully operating range), until the lead levels are reduced below the recommended level. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Gosse Court/Moulton Readiness Center in Burlington, Vermont. Non-Responsive performed the evaluation on 21 July 2003 and 8 October 2003. The point of contact at the readiness center was SGT 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 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 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/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 hall. If there were any positive results from the drill floor/assembly hall, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at three locations. The sample collected in the assembly room at the soda machine top surface location had a lead concentration of 580 $\mu g/ft^2$. The sample collected from the kitchen counter had a lead concentration of 770 $\mu g/ft^2$. The sample collected from the floor outside the firing range had a lead concentration of 60,000 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the assembly room, classroom, kitchen, and floor outside the firing range. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.

2.1.2 Air Sampling for Lead

Breathing zone air sampling was conducted on one (1) full-time building occupant. (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 actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was not observed at the armory.

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 floor tiles (approximately 2563 square feet) and boiler room insulation material (approximately 18.5 linear feet). The floor tiles were observed in the front offices, inclusive of the three front offices, training room, two offices adjacent to the training room, classroom, meeting room, and lobby. Please note that two offices adjacent to the lobby latrine are assumed to have the suspected asbestos-containing floor tiles; therefore, the estimate of square feet of floor tiles material is greater than 2563 square feet.

The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage). The condition of the floor tiles materials was considered

average to poor since there were many broken tiles in the lobby and meeting rooms and many loose tiles through out the facility. A bulk sample was collected from the lobby floor, the results revealed asbestos in the form of chrysotile of between 1% and 3 % in the brown compact material.

An operation and maintenance plan should be followed when performing any activities that may disturb the asbestos-containing and 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. Water damage and visible mold were not observed at the armory. Please note that the ceilings in the meeting room and classroom are stained due to old water damage. The source of the water damage was roof leaks and the roof was replaced last year.

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

2.3.2 Indoor Air Quality

Interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the latrines where there is a minimal fresh air. In addition, measurements for humidity revealed a level that exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition a fan can be used for circulating air in the latrines.

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 the HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. Results of the lighting evaluation are provided in Table 4. As can be seen from the results, the lighting did not meet the minimum requirements in some areas, including the two front offices.

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 Indoor Firing Ranges

There was not a converted firing range at the facility; however, there was an inactive indoor firing range. For informational purposes, wipe samples were taken for lead at various locations in or near the range. The results are provided in Table 5. As expected, the results revealed lead at extremely high concentrations. This inactive firing range should not be used for any purposes, except as a firing range (if approved as a fully operating range), until the lead levels are reduced 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). For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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 lead-based paint, water damage, visible mold, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, indoor air quality, surface lead contamination in the inactive firing range, 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
Burlington, Vermont
Dates of Sampling: 21 July 2003 and 8 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTGOS202-1	Drill Floor -- On Floor (See Building Layout -- Appendix B)	< 110
VTGOS202-2	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTGOS202-3	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTGOS202-4	Drill Floor - On Floor (See Building Layout Appendix B)	< 110
VTGOS202-5	Drill Floor – On Floor (See Building Layout -- Appendix B)	< 110
VTGOS202-6	Field Blank	< 12 µg
VTGOS202-15	Office– coat hanger top surface	39
VTGOS202-16	Classroom – window sill	79
VTGOS202-17	Office desktop	5.5
VTGOS202-18	Field Blank	0.42 µg
VTGOS202-19	Kitchen - counter top	770
VTGOS202-20	Supply Room (office area) filing cabinet top surface	31
VTGOS202-21	Meeting Room - table top	8.1
VTGOS202-22	Supply Room -- wall	7.7
VTGOS282-1	Assembly Room -- soda machine top surface (See Building Layout -- Appendix B)	580
VTGOS282-2	Assembly Room - flammable cabinet top surface (See Building Layout - Appendix B)	31
VTGOS282-3	Assembly Room -- cabinet top surface (See Building Layout -- Appendix B)	26

[a] Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
Burlington, Vermont
Dates of Sampling: 21 July 2003 and 8 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTGOS282-4	Assembly Room – Old supply room service windowsill (See Building Layout – Appendix B)	130
VTGOS282-5	Assembly Room – New supply room service windowsill (See Building Layout – Appendix B)	74
VTGOS282-6	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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Burlington, Vermont
Date of Sampling: 21 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTGOS202-A1	Steffan Defeo	1339-1449 / 70	2.5043	175.30	< 0.006
VTLUD212-A2	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
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Burlington, Vermont
Date of Sampling: 21 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor	1	463	68.6	75.4
Outdoors	0	402	57.3	78.1

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

Burlington, Vermont

Date of Sampling: 21 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Kitchen	43.0-85.2	70	Some areas
Meeting Room	43.2-115.3	70	Some areas
Classroom	61.4-79.3	70	Some areas
Front office	40.1-53.6	70	No
Front office (adjacent to lobby)	21.2-44.3	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 5

Wipe Sampling for Lead – Firing Range

National Guard Armory

Burlington, Vermont

Date of Sampling: 21 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTLUD212-7	Exhaust ventilation system (taken outside)	320000
VTLUD212-8	Bullet Trap	330000
VTLUD212-9	Light Fixtures	11000
VTLUD212-10	Overhead Heaters	220000
VTLUD212-11	Stored Item	4100
VTLUD212-12	Field Blank	< 12 µg
VTLUD212-13	Floor	30000
VTLUD212-14	Floor Outside the Range	60000

[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.

Appendix A
HHIM Data Form(s)

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.
	Moulton/Goss Court Armory, Vermont ARNG	Burlington

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative Operations / ADO

SURVEY DATE	EVALUATOR (Initials)
21 July 2008	MS

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive SGT

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802 863-7677	Company B 4th Bodtalion		8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO.OTHER
0	4	0	0	0

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/FT	R	U
CHEMICAL SPLASH			CANAL CAPS			APRONS			COLD WEATHER BOOTS/HATS		
FULL FACE SHIELD			EAR PLUGS			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
PVDDTXXXX	Video display unit	low	D Uncontrolled Physical
1332-21-4	Asbestos other	2-moderate	C Uncontrolled Respiratory
7439-92-1	Lead/organic dusts and fumes, as Pb	2-moderate	C Uncontrolled Respiratory
12001-29-5	Asbestos (Chrysotile)		C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive			M	Non-Responsive	MIL
		A.			
		P.			
		A			

SECTION 6. COMMENTS

No comments. See attached sheet

Survey conducted by Michele Sauvan. Building contains four(4) full time military staff members. Staff performs mainly administrative functions. Please note a Youth program is based at the Essex County Armory and both military and youth program staff and children utilize drill hall/ assembly room.

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.

Gosse Court Armory Full Time Personnel

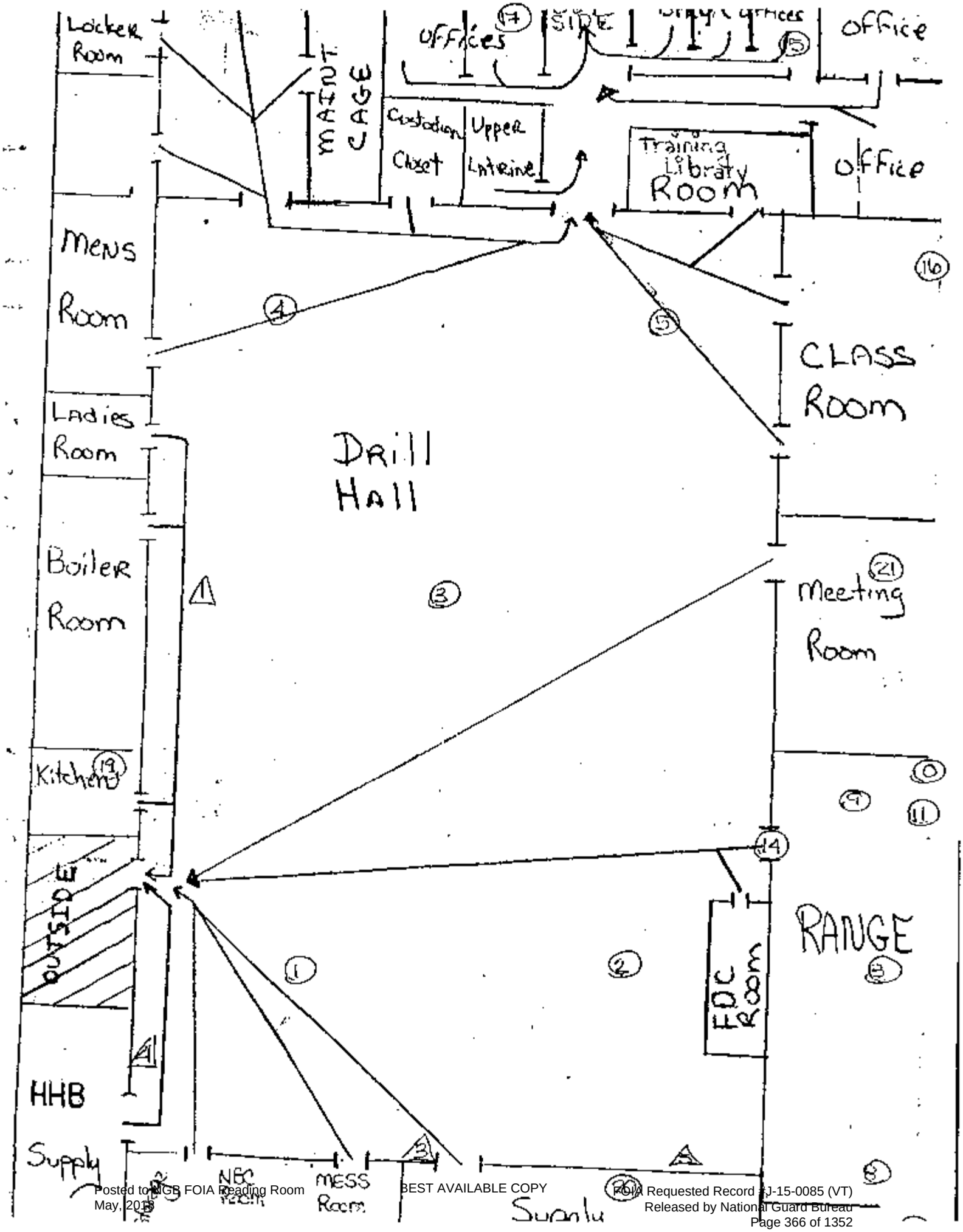
Non-Responsive E5 (Non-Responsive

[redacted]/E6

[redacted]SG/E6

[redacted]SFC/E7 (Recruiter)

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:**	VTGOS202	**Chain Of Custody:**	115811
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/05/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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
0359501	VTGOS202-1	Flame	Wipe	****	0.111	108.00	ug/ft^2	< 110	ug/ft^2	
0359502	VTGOS202-2	Flame	Wipe	****	0.111	108.00	ug/ft^2	< 110	ug/ft^2	
0359503	VTGOS202-3	Flame	Wipe	****	0.111	108.00	ug/ft^2	< 110	ug/ft^2	
0359504	VTGOS202-4	Flame	Wipe	****	0.111	108.00	ug/ft^2	< 110	ug/ft^2	
0359505	VTGOS202-5	Flame	Wipe	****	0.111	108.00	ug/ft^2	< 110	ug/ft^2	
0359506	VTGOS202-6	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359507	VTGOS202-7	Flame	Wipe	****	0.111	108.00	ug/ft^2	320000	ug/ft^2	
0359508	VTGOS202-8	Flame	Wipe	****	0.111	108.00	ug/ft^2	330000	ug/ft^2	
0359509	VTGOS202-9	Flame	Wipe	****	0.111	108.00	ug/ft^2	11000	ug/ft^2	
0359510	VTGOS202-10	Flame	Wipe	****	0.111	108.00	ug/ft^2	220000	ug/ft^2	
0359511	VTGOS202-11	Flame	Wipe	****	0.111	108.00	ug/ft^2	4100	ug/ft^2	
0359512	VTGOS202-12	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359513	VTGOS202-13	Flame	Wipe	****	0.111	108.00	ug/ft^2	30000	ug/ft^2	
0359514	VTGOS202-14	Flame	Wipe	****	0.111	108.00	ug/ft^2	60000	ug/ft^2	

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

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTGOS202	**Chain Of Custody:**	115811
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/05/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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

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] Non-Responsive

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4475 Forbes Blvd. • Lanham, MD 20706 • (301) 459-2640 • Toll Free (800) 346-0961 • Fax (301) 459-2643

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A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

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Client:	National Guard Bureau	**Job Name:**	VTGOS202	**Chain Of Custody:**	118933
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/30/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-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
0404847	VTGOS202-15	Furnace	Wipe	****	0.111	6.75	ug/ft²	39	ug/ft²	
0404848	VTGOS202-16	Furnace	Wipe	****	0.111	13.50	ug/ft²	79	ug/ft²	
0404849	VTGOS202-17	Furnace	Wipe	****	0.111	2.70	ug/ft²	5.5	ug/ft²	
0404850	VTGOS202-18	Furnace	Wipe Blank	****	N/A	0.30	ug	0.42	ug	
0404851	VTGOS202-19	Furnace	Wipe	****	0.111	135.01	ug/ft²	770	ug/ft²	
0404852	VTGOS202-20	Furnace	Wipe	****	0.111	5.40	ug/ft²	31	ug/ft²	
0404853	VTGOS202-21	Furnace	Wipe	****	0.111	2.70	ug/ft²	8.1	ug/ft²	
0404854	VTGOS202-22	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.7	ug/ft²	

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
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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTGOS282	**Chain Of Custody:**	118713
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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
0402886	VTGOS282 -1	Furnace	Wipe	****	0.111	67.51	ug/ft²	580	ug/ft²	
0402887	VTGOS282 -2	Furnace	Wipe	****	0.111	5.40	ug/ft²	31	ug/ft²	
0402888	VTGOS282 -3	Furnace	Wipe	****	0.111	2.70	ug/ft²	26	ug/ft²	
0402889	VTGOS282 -4	Furnace	Wipe	****	0.111	67.51	ug/ft²	130	ug/ft²	
0402890	VTGOS282 -5	Furnace	Wipe	****	0.111	13.50	ug/ft²	74	ug/ft²	
0402891	VTGOS282 -6	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]

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
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, INC.

SUBMITTED TO:

Non-Responsive

Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

REFERENCE DATA:

Client Sample No.:	VTG05202-B1
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Bulk
Method Reference:	EPA-600/R-93/116
DCL Set ID No.:	03-A-3621
DCL Sample ID No.:	03-22334
Sample Receipt Date:	7/28/03
Analysis Date:	7/30/03

We certify that the following samples were prepared and analyzed by Polarized Light Microscopy for asbestos and other fibrous constituents using EPA-600/R-93/116. The samples were acceptable upon receipt except where noted. The samples were examined under a stereomicroscope in a laboratory fume hood for general composition and phase separation. If needed, portions of the sample were removed and ground with a mortar and pestle before being mounted on a glass microscope slide. Mountings of representative portions of the material are prepared in one or more appropriate refractive index liquids (1.550, 1.605, 1.680) and examined by Polarized Light Microscopy*. Estimates of concentration are made on an area basis. The results of the analysis apply only to the materials analyzed and are summarized on the attached bulk asbestos analysis data sheets. DataChem Laboratories will dispose of all bulk samples after 60 days unless other arrangements are made.

Non-Responsive
Analyst

Non-Responsive
Reviewer

*Floor tiles, decorative paints, joint compounds, and cement materials require additional treatment in order to evaluate the concentration of small asbestos fibers bound in the material. Some samples may contain fibers that are not visible by PLM and can only be detected by electron microscopy techniques. Floor tiles are analyzed as homogeneous materials if insufficient mastic is present or if phases have been cross contaminated.

DataChem Laboratories NVLAP Lab ID: 101917. Laboratory accreditation by the National Institute of Standards and Technology does not in any way constitute approval or endorsement by NIST.

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7/30/03

DataChem Laboratories
Polarized Light Microscopy
Asbestos Analytical Report

Client: Shaw Environmental, Inc.
Location: VT
Set ID: 03-A-3621

Client Sample ID:	VTG05202-B1	VTG05202-B1
DCL Sample ID:	03-22334A	03-22334B
Macroscopic Examination		
Accepted/Rejected:	Accepted	Accepted
Homogeneity:	Layered	Layered
Color:	Brown	Black
Texture:	Compact	Resinous
Description:	Tile	Mastic
Analysis:	PLM	PLM
Asbestiform Minerals		
% Chrysotile:	>1≤3	
% Amosite:		
% Crocidolite:		
% Tremolite - Actinolite:		
% Anthophyllite:		
% Total Asbestos:	**>1≤3**	**ND**
Other Materials		
% Cellulose:		
% Fiberglass:		
% Other Fibers:		
% Resin/Binder:	>10≤20	>70≤80
% Non Fibrous:	>70≤80	>10≤20

ND = None Detected Trace = <1%

Special Prep Procedures: None.

*Notes: P. O. #: 07-02.

Non-Responsive

Microscopist

All values are in area percent by visual estimate. The Federal Register Vol. 55 No. 224 Tuesday Nov. 20 1990 Rules and Regulations states "... If the asbestos content is estimated to be less than 10% by a method other than point counting,... (the analysis) be repeated using the point counting technique by PLM." Any of the above samples can be reanalyzed by point counting at the client's request.
Wherever possible, separate phases are analyzed and reported individually.

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory Location: GOS
Date: 202

Sample 1

Sample Number: VTGOS202-A1
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.537	2.476
	2.521	2.485
	2.524	2.486
	2.519	2.486
Average	2.525	2.483

Average Pre and Post 2.5043

Time 1 13:39
Time 2 14:49
Total Time Sampled 1:10
Minutes Sampled 70.00

Volume 175.30 Liters

Sample 2

Sample Number: N/A
Pump: N/A

	Pre Flow Rate	Post Flow Rate
	N/A	N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
Average	N/A	N/A

Average Pre and Post N/A

Time 1 N/A
Time 2 N/A
Total Time Sampled N/A
Minutes Sampled N/A

Volume N/A 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, Preventive 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.

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Shaw® Shaw Environmental, Inc.

National Guard Armory
Green Mountain Readiness Center – Colchester, Vermont

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

24 May 2004

National Guard Armory
Green Mountain Readiness Center – Colchester, Vermont

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

24 May 2004

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. (Shaw) was contracted to perform an industrial hygiene evaluation for the Green Mountain Readiness Center in Colchester, Vermont. Non-Responsive Non-Responsive performed the evaluation on 16 and 17 July 2003 and 9 October 2003. The point of contact at the readiness center was LTC 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 Range
- 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
- Suspected Asbestos Containing Material
- Housekeeping
- Safety and Industrial Hygiene Programs
- Contamination of Clean Air Sources

- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level in the assembly area/drill floor, rooms on the second floor, and the floor outside the firing range. It is recommended that these surfaces and the areas immediately around these surfaces be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor and rooms on the second floor should be thoroughly cleaned.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall, rooms E249, E236, E209, E203, and E228 located on the second floor, rooms B159 and C110 located on the first floor, the HVAC system providing air to the second floor of the building, and the floor outside the firing range. Areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.
- Water damage was observed at several locations at the armory. The source of the water damage was likely from roof leaks or condensation from the HVAC unit. The source of the water damage should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Visual mold was observed in the armory. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.
- Interviews with employees revealed that one employee is currently experiencing tingling of hands and other symptoms of carpal tunnel syndrome. Note that the employee has been fitted with an ergonomically correct keyboard. In addition, ergonomic concerns have occurred in the past year and have been corrected. Two employees have been fitted with new chairs due to back pain, and an employee in the personnel department has had carpal tunnel surgery. An extensive evaluation should

be performed to determine if the workstations should be improved from an ergonomic standpoint.

- Indoor air quality measurements revealed that the humidity at the armory exceeded the recommended levels. These areas should be evaluated to determine if the humidity could be controlled by the use of de-humidifiers or similar devices. In addition, interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the men and women's shower rooms, Room C115 (Band Rehearsal Hall), and in the A156 rooms. It is recommended that air circulation and ventilation be improved at the armory in the locations noted above.
- The exhaust ventilation system in the active firing range should be evaluated because it appears that the airflow is slow to exhaust due to the firing range floor plan. Lane 1 in directly in front of the entrance to the room and the remaining lanes are directly in front of the ventilation system.
- The lighting did not meet the minimum requirements in many areas of the armory. Consideration should be given to providing more lighting to these areas. 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.
- There was not a converted firing range at the facility; however, there was an active indoor firing range. For informational purposes, wipe samples were taken for lead at various locations in or near the range. As expected, the results revealed lead at extremely high concentrations. This active firing range should not be used for any purposes except as a firing range.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Green Mountain Readiness Center in Colchester, Vermont Non-Responsive Non-Responsive performed the evaluation on 16 and 17 July 2003 and 8 October 2003. The point of contact at the readiness center was LTC 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 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 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/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 hall. If there were any positive results from the drill floor/assembly hall, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at four locations. One sample collected from the drill hall floor had a lead concentration of 300 $\mu g/ft^2$. The sample obtained from the air grille located on the second floor in Room E238 had a lead concentration of 990 $\mu g/ft^2$. Both samples obtained from cabinet top surfaces located on the second floor in rooms E259 and E221 had lead concentrations of 210 $\mu g/ft^2$. The sample obtained from the floor outside the firing range had a lead concentration of 1900 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any

other dusty/dirty areas in the assembly area/drill floor and second floor rooms indicated above should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 µg/ft^2 in the assembly hall, rooms E249, E236, E209, E203, and E228 located on the second floor, rooms B159 and C110 located on the first floor, and the HVAC system providing air to the second floor of the building. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas with lead concentrations above 40 µg/ft^2 that will be accessible to children should be 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.

2.1.2 Air Sampling for Lead

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 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. 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. Water damage and visible mold were observed at the armory. Water damage was observed on the ceilings in the medical wing located on the second floor in Rooms E250, E251, E253, E260, E256 and E259. Water damage was also observed on the ceiling of the second floor hallway. Water damage was observed on ceilings on the first floor in the men's latrine/shower room, room C115 and adjacent to the door to room C114. Mold was observed on the ceilings of men's latrine/shower room, room E256, and room E259.

The source of the water damage was likely from roof leaks, or condensation from the HVAC unit concerning the medical wing water damage. Please note that the AC unit is continually in use in the medical wing area for equipment preservation. The source of the water damage should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate it.

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 one employee is currently experiencing tingling of hands and other symptoms of carpal tunnel syndrome. Note that the employee has been fitted with an ergonomically correct keyboard. In addition, ergonomic concerns have occurred in the past year and have been corrected. Two employees have been fitted with new chairs due to back pain, and an employee in the personnel department has had carpal tunnel surgery. An extensive evaluation should be performed to determine if the workstations should be improved from an ergonomic standpoint.

2.3.2 Indoor Air Quality

Interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the men and women's shower rooms, Room C115 (Band Rehearsal Hall), and A156. Please note that the employees who occupy Room A156 have complained of sicknesses due to air quality issues. In addition, measurements for humidity revealed a level on the second floor exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. These areas should be evaluated to determine if the humidity could be controlled by the use of de-humidifiers or similar devices. The HVAC system is not utilized on a continual basis due to energy conservation practices; fans are mounted on office walls to circulate air. It is recommended that air circulation and ventilation be improved at the armory in the locations noted above.

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 the hearing conservation, HAZCOM, and PPE programs were applicable at the facility. The programs were evaluated and it was determined that the program met minimum requirements. Please note that the hearing conservation and PPE programs are applicable only when the firing range located at the facility is in use. The hearing conservation program may also be applicable during band rehearsal.

2.5. Ventilation

2.5.1 Ventilation System Evaluation

There was a local exhaust ventilation system located in the active firing range at the armory. The exhaust ventilation system in the active firing range should be evaluated because it appears that the airflow is slow to exhaust due to the firing range floor plan. Lane 1 in directly in front of the entrance to the room and the remaining lanes are directly in front of the ventilation system.

2.5.2 Contamination of Clean Air Sources

There is no evidence 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 except in the firing range. Personal protective equipment is required by those using the firing range.

2.7 Lighting

Lighting measurements were conducted at the armory. Results of the lighting evaluation are provided in Table 4. As can be seen from the results, the lighting did not meet the minimum requirements in many areas. 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 Indoor Firing Ranges

There was not a converted firing range at the facility; however, there was an active indoor firing range. For informational purposes, wipe samples were taken for lead at various locations in or near the range. The results are provided in Table 5. As expected, the results revealed lead at extremely high concentrations. This active firing range should not be used for any purposes except as a firing range.

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 HVAC system is not utilized on a continual basis due to energy conservation practices.

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, suspected asbestos-containing material, housekeeping, safety and industrial hygiene programs, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, water damage, visible mold, ergonomic conditions, indoor air quality, ventilation systems, contamination of clean air sources, lighting, and surface lead contamination in the firing range. These concerns are discussed in detail in Section 2.0 of this report.

TABLES

Table 1
Wipe Sampling for Lead
National Guard Armory
Colchester, Vermont
Dates of Sampling: 16 and 17 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTGRE197-1	Drill Floor – On Floor (See Building Layout – Appendix B)	300
VTGRE197-2	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTGRE197-3	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTGRE197-4	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTGRE197-5	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTGRE197-6	Field Blank	< 12 µg
VTGRE197-13	Second Floor – Room E238 – air grille	990
VTGRE197-14	Second Floor – Room E249 – desktop	170
VTGRE197-15	Second Floor – Room E259 – cabinet top surface	210
VTGRE197-16	Second Floor – Room E236 – desktop	190
VTGRE197-17	Second Floor – Room E221 – cabinet top surface	210
VTGRE197-18	Field Blank	< 12 µg
VTGRE197-19	Second Floor – Room E209 – desktop	120
VTGRE197-20	Second Floor – Room E203 – shelf top surface	170
VTGRE197-21	Second Floor – Room E215 – desktop	< 110
VTGRE197-22	Second Floor – Room E228 – Classroom tabletop	< 110
VTGRE198-23	Second Floor – Room E216 – desk shelf top surface	< 110
VTGRE198-24	Field Blank	< 12 µg
VTGRE198-25	Second Floor – Room E211 – desktop	< 110
VTGRE198-26	Second Floor – Room E223 – television top surface	< 110
VTGRE198-27	Second Floor – Room E228 – windowsill	160
VTGRE198-28	First Floor – Room B159 – tabletop	170
VTGRE198-29	First Floor – Room B131A – bookshelf top surface	< 110
VTGRE198-30	Field Blank	< 12 µg
VTGRE198-31	First Floor – Room B133 – desktop	< 110
VTGRE198-32	First Floor – Room C108 – desktop	< 110

[a] Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
Colchester, Vermont
Dates of Sampling: 16 and 17 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTGRE198-33	First Floor – Room C115 – heating vent top surface	< 110
VTGRE198-34	First Floor – Room C110 – counter top surface	< 110
VTGRE198-35	First Floor – Room B140 – top surface of stored item	< 110
VTGRE198-36	Field Blank	< 12 µg
VTGRE198-37	First Floor – Room B109 – desktop	< 110
VTGRE198-38	First Floor – Room B122 – kitchen bottom shelf surface	< 110
VTGRE198-39	First Floor – Room B100A – desk cabinet surface	< 110
VTGRE198-40	First Floor – Room A174 – desk shelf top surface	< 110
VTGRE198-41	First Floor – Room A172 – desktop	< 110
VTGRE198-42	Field Blank	< 12 µg
VTGRE198-43	First Floor – lobby – tabletop	< 110
VTGRE198-44	First Floor – Room A117 – bookshelf top surface	< 110
VTGRE198-45	First Floor – Room A103 – table top	< 110
VTGRE198-46	First Floor – Room A134 – cabinet top surface	< 110
VTGRE198-47	First Floor – Room A142 – desktop	< 110
VTGRE198-48	Field Blank	< 12 µg
VTGRE198-49	First Floor – Room A158 – coat hanger top surface	< 110
VTGRE198-50	First Floor – Room A157 – desktop	< 110
VTGRE198-51	First Floor – Room A152 – cabinet top surface	< 110
VTGRE198-52	First Floor – Room A151 – desktop	< 110
VTGRE198-53	First Floor – Room A156 – table top	< 110
VTGRE198-54	Field Blank	< 12 µg
VTGRE198-55	First Floor – Room A156B – cabinet top surface	< 110
VTGRE198-56	First Floor – Room A156D – cabinet top	< 110
VTGRE198-57	First Floor – Room A178 – table top	< 110
VTGRE198-58	First Floor – Room B102 – table top	< 110

[a] Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
Colchester, Vermont
Dates of Sampling: 16 and 17 July 2003 and October 2003

Sample Number	Location	Results, µg/ft² [a]
VTGRE198-59	First Floor – Room C112 cabinet top surface	< 110
VTGRE198-60	Field Blank	< 12 µg
VTGRE198-61	First Floor - - Assembly hall – serving cart top surface	< 110
VTGRE198-62	First Floor - - Room A166-- table top	< 110
VTGRE198-63	First Floor – Room A167 - desktop	< 110
VTGRE283-1	HVAC system-supply air grille (fan side of filter) Room B236	22
VTGRE283-2	HVAC system-supply side of filter	78
VTGRE283-3	Assembly Room -- desk surface (See Building Layout – Appendix B)	52
VTGRE283-4	HVAC system-supply air grille (filter side) Room A134	18
VTGRE283-5	HVAC system-supply air grille (filter side) Room C110	150
VTGRE283-6	Field Blank	0.35 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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Colchester, Vermont
Date of Sampling: 16 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTGRE197-A1	Non-Responsive	1343-1520/97	2.4799	240.55	< 0.004
VTGRE197-A2		1357-1537/100	2.5076	250.76	< 0.004
VTGRE197-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
Netional Guard Armory
Colchester, Vermont
Date of Sampling: 16 August 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
Outdoors	0	358	52.6	85.8
1st Floor	1	422	57.0	77.7
2nd Floor	1	379	71.6	76.5

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 4

Illumination Readings

National Guard Armory

Colchester, Vermont

Date of Sampling: 16 and 17 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Second Floor – Room E238 Office	30.3-142.3	70	Some areas
Second Floor – Room E249 Exam Room	40.7-142.3	70	Some areas
Second Floor - Room E251 Exam Room	32.1-100.1	70	Some areas
Second Floor – Room E236 Office	33.9-111.1	70	Some areas
Second Floor - Room E221 Office	8.0-134.6	70	Some areas
Second Floor - Room E209 Office	20.1-135.5	70	Some areas
Second Floor - Room E216 Office	18.1-118.3	70	Some areas
Second Floor - E211 Room Office	22.1-110.7	70	Some areas
First Floor - Room B159 Office	17.4-141.3	70	Some areas
First Floor – Room C115 Band Rehearsal Room	3.6-201	70	Some areas
First Floor – Room C112 Office	30.1-143.2	70	Some areas
First Floor - Room B122 Kitchen	63.2-117.1	70	Some areas
First Floor – Room B100A Office	48.3-119.6	70	Some areas
First Floor - Room A174 Office	84.1-143.3	70	Yes
First Floor - Room A172 Office	51.2-134.6	70	Some areas
First Floor - Room A103 Office	23.1-102.5	70	Some areas
First Floor - Room C108 Office	24.5-113	70	Some areas
First Floor – Room B131A Office	18.1-141	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.

Table 5

Wipe Sampling for Lead – Firing Range

National Guard Armory

Colchester, Vermont

Date of Sampling: 16 and 17 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTGRE197-7	Bullet Trap	260000
VTGRE197-8	Overhead Heaters	260000
VTGRE197-9	Stored Item (table top)	1500
VTGRE197-10	Floor	260000
VTGRE197-11	Floor Outside the Range	1900
VTGRE197-12	Blank	< 12 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.

Appendix A
HHIM Data Form(s)

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.
	Green Mountain Armory Vermont ARNG	Colchester

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative Operations / ADO

SURVEY DATE	EVALUATOR (Initials)
16 and 17 July 2003	ND

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive LTC

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-338-3337	Headquarters Vermont National Guard	4	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
11	123	0	0	0

SECTION 2. FACILITY DATA

LAB HOODS	VAPOR DEGREASERS	SPRAY BOOTHS
0	0	0

MAINTENANCE BAYS	OPEN SURFACE TANKS	VENTILATION UNITS
0	0	1

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			EAR PLUGS			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 Terminals	3-low	D-Uncontrolled Physical
7439-92-1	Lead, Inorganic dust+Fumes, as Pb	2-moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
see attached list					

SECTION 6. COMMENTS

___No comments See attached sheet

Michele Sevan conducted survey. Building contains Military staff. Employee personnel mainly Administrative functions. Please note mold was observed in office on the second floor and the men's bathroom on the first floor

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.

Non-Responsive						
	LTC	338-3160		STAFF JAG	GMA	VT-JAG
	MSGT	338-3145		HRO	GMA	VT-HRO
	SFC	338-3151		DCSOPS	GMA	VT-DCSOPS-R
	SPC	338-3050		VT-EOC	GMA	VT-EOC
	SFC	338-3050		VT-EOC	GMA	VT-EOC
	MAJ	338-3150		DCSOPS	GMA	VT-DCSOPS-R
	CW2	338-3144		HRO	GMA	VT-HRO
	CW2	338-3347		DPA	GMA	VT-DPA-FP
	SFC	338-3437		RRO	GMA	VT-DPA-R
	1LT	338-3131		DPA & TQM	GMA	VT-DPA/TQM
	SGM	338-3176		RRO	GMA	VT-DPA-R
	MAJ	338-3449		RRO	GMA	VT-DPA-R
	LTC	338-3242		SRAAG	GMA	AFKA-A-VT
	MR	338-3021		HRO	GMA	VT-HRO
	LTC	338-3160		JAG	GMA	VT-JAG
	SGM	338-3153		DCSOPS	GMA	VT-DCSOPS-TA
	CPT	338-3397		COUNTER DRUG	GMA	VT-CD-DDR
	MSG	338-3126		HQ VTANG	GMA	VTANG-CS
	SGT	338-3456		STATE MEDICAL CMD	GMA	W77950
	SPC	338-3333		DPA	GMA	VT-DPA-O
	SPC	338-3471		PUBLIC AFFAIRS	GMA	VT-PAO
	SSG	338-3143		HRO	GMA	VT-HRO
	COL	338-3140		HRO	GMA	VT-HRO
	SFC	338-3173		RRO	GMA	VT-DPA-R
	SSG	338-3465		131 ENGR CO	GMA	WP8JAA

M-DAY

Non-Responsive

[redacted]	CSM	338-3123		TAGO-VT	GMA	VT-CSM	
	MRS	338-3423		DPA	GMA	VT-DPA	
	SSG	338-3152		DCSOPS	GMA	VT-DCSOPS	
	~~LTC~~	338-3431		HQ-VTANG	~~GMA~~	VTANG-CS	n-Day
	SFC	338-3132		DPA	GMA	VT-DPA-E	
	COL	338-3122		CHIEF OF STAFF	GMA	VT-CS	
	SFC	338-3480		BAND/PAD	GMA	WQJ8AA	
	SGT	555-0542		RRO	GMA	VT-DPA-R	
	LTC	338-3130		DCSPER	GMA	VT-DCSPER	
	SSG	338-3135		DPA	GMA	VT-DPA-E	
	MR	338-3124		TAGO-VT	GMA	VT-AG	
	1SG	338-3421		Mob Readiness RRO	GMA	~~VT-DPA-ME~~ ~~VT-DPA-R~~	
	LTC	338-3453		INSPECTOR GENERAL	GMA	VT-IG	
	SSG	338-3475		COUNTER DRUG	GMA	VT-CD	
	TSGT	338-3245		HRO	GMA	VT-HRO	
	SFC	338-3153		DCSOPS	GMA	VT-DCSOPS-TA	
	SFC	338-3174		RRO	GMA	VT-DPA-R	
	CPT	338-3163		DSCOPS	GMA	VTPDCSOPS	
	MAJ	338-3440		DRUG DEMAND REDUCTION	GMA	VT-CD-DDR	
	~~SFC~~	~~338-3146~~		~~HRO~~	~~GMA~~	~~VT-HRO-ST~~	goes to Afganistan
	SSG	338-3166		INFO MGMT OFFICE	GMA	VT-IM-AS	
	CPT	338-3151		DCSOPS	GMA	VT-DCSOPS-R	
	TSGT	338-3478		HQ VTANG	GMA	VT-PAO	
	SFC	338-3450		HQ STARC (-)	GMA	W8BFAA	
	SFC	338-3172		RRO	GMA	VT-DPA-R	
	MSG	338-3133		SIDPERS	GMA	VT-DPA-S	

Non-Responsive

SFC	338-3454		RRO	GMA	VT-DPA-R
~~SFC~~	338-3456		~~STATE MEDICAL OMD~~	GMA	W99750
SGT	338-3152		DCSOPS	GMA	VT-DCSOPS
SPC	338-3430		INFO MGMT OFFICE	GMA	VT-IM-AS
SSG	338-3452		HQ STARC (-)	GMA	W8BFAA
SGT	338-3171		RRO	GMA	VT-DPA-R
SPC	338-3137		DPA-O	GMA	VT-DPA-O
SSG	338-3197		HRO	GMA	VT-HRO
SFC	338-3254		HRO	GMA	VT-HRO
LTC	338-3337		SAFTEY	GMA	VT-DPA-VPP
MRS	338-3241		SRAAG	GMA	AFKA-A-VT
2LT	338-3488		POMSO	GMA	VT-PTS-MS
BG	338-3492		HQ VTANG	GMA	VTANG-CS
SMS	338-3249		HQ VTANG	GMA	VTANG-CS
SFC	338-3155		DCSOPS	GMA	VT-DCSOPS-TA
SFC	338-3330		INFO MGMT OFFICE	GMA	VT-IM-AS
MSG	338-3451		COUNTER DRUG	GMA	VT-CD-DDR
SGT	338-3297		DPA	GMA	VT-DPA-P
CMS	338-3128		~~HQ VTANG~~	GMA	~~VTANG-CMS~~
MSG	338-3126		HQ ANG	GMA	VTANG-CS
SGT	338-3476		40th ARMY BAND	GMA	WQJ8AA
BG	338-3121		TAGO-VT	GMA	VT-DAG
LTC	338-3157		DCSOPS	GMA	VT-DCSOPS-TA
MSG	338-3142		HRO	GMA	VT-HRO
2LT	338-3448		RRO	GMA	VT-DPA-R

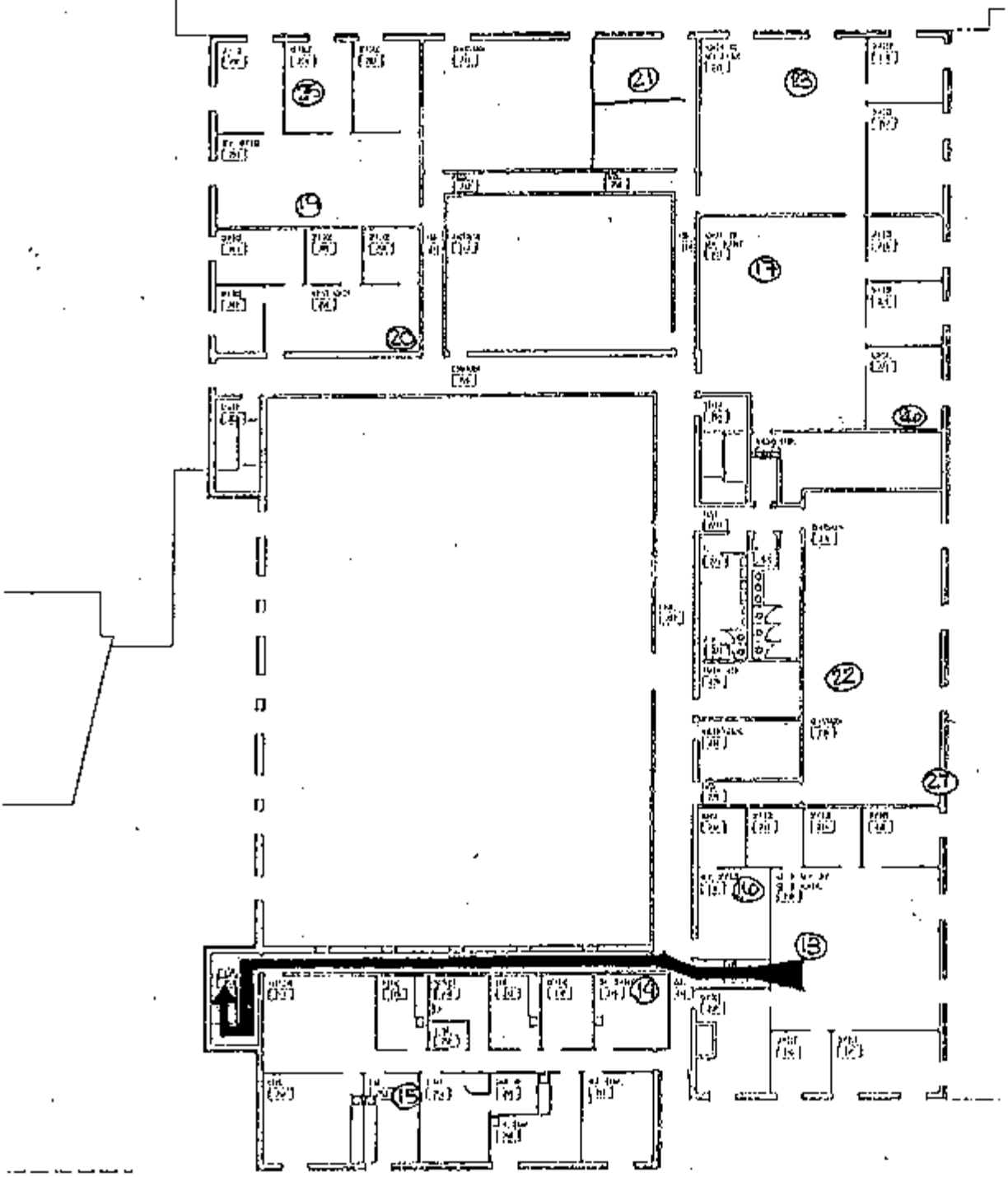
Non-Responsive

MSG	338-3292		TELECOMMUNICATIONS	GMA	VT-IM-CE
SSG	338-3082		STATE JAG OFFICE	GMA	VT-JAG
COL	338-3179		ESSO , ST HQ/ AIR STAFF	GMA	VT-ESSO
MAJ	338-3131		DPA	GMA	VT-DPA-O
CW4	338-3136		DPA	GMA	VT-DPA-HS
SGM	338-3159		POMSO	GMA	VT-PTS-MS
MAJ	338-3350		COUNTER DRUG	GMA	VT-CD
COL	338-3140		HRO	GMA	VT-HRO
LTC	338-3348		DCSPER	GMA	VT-DPA-ES
SGT	338-3476		BAND/PAD	GMA	WQJ8AA
MG	338-3124		TAGO-VT	GMA	VT-AG
SSG	338-3061		STATE MEDICAL CMD	GMA	W77950
SPC	338-3191		DPA	GMA	VT-DPA-E
SPC	338-3058		VTNG EOC	GMA	VT-EOC
SFC	338-3344		COUNTER DRUG	GMA	VT-CD
SFC	338-3346		DPA (SRIP)	GMA	VT-DPA
CPT	338-3246		PAO	GMA	VT-PAO
MRS	338-3154		MEDICAL REDINESS	GMA	VT-DPA-MR
MS	338-3314		ACCT & PERSONNEL	GMA	VT-AG
CW3	338-3052		VTNG EOC	GMA	VT-EOC
PFC	338-3000		INFO MGMT OFFICE	GMA	VT-IM-AS
MSG	338-3349		INFO MGMT OFFICE	GMA	VT-IM-IS
MAJ	338-3163		DCSOPS	GMA	VT-DCSOPS-TA
LTC	338-3129		CHIEF OF STAFF	GMA	VT-CS

Non-Responsive

BG	338-3424		HQ VTANG	GMA	VT-ANG-AAG	
MRS	338-3116		TAGO-VT	GMA	VT-AG	
MS	338-3158		DCSOPS	GMA	VT-DCSOPS	
CPT	338-3141		HRO	GMA	VT-HRO	
~~CW4~~	~~338-3488~~		~~POMSO~~	~~GMA~~	~~VT-PTS-MS~~	retired
SFC	338-3139		SIDPERS	GMA	VT-DPA-S	
SSG	338-3458		131 ENGR CO	GMA	WP8JAA	
LTC	338-3342		POMSO	GMA	VT-PTS-MS	
SSG	338-3138		SIDPERS	GMA	VT-DPA-S	
MRS	338-3310		ACCT & PERSONNEL	GMA	VT-AG	
MSG	338-3128		HQ ANG	GMA	VTANG-CS	
~~COL~~	~~338-3127~~		~~HQ VTANG~~	~~GMA~~	~~VTANG-CS~~	retired
CWO	338-3177		HRO	GMA	VT-HRO	
CMS	338-3148		HRO	GMA	VT-HRO	
SFC	338-3171		RRO	GMA	VT-DPA-R	
~~COL~~	~~338-3453~~		~~INSPECTOR GENERAL~~	~~GMA~~	~~VT-IG~~	retired
SGT	338-3419		DPA - ID CARD SECTION	GMA	VT-DPA-ID	
SFC	338-3466		131 ENGR CO	GMA	WP8JAA	
LTC	338-3147		HRO	GMA	VT-HRO	
COL	338-3156		POTO/DCSOPS	GMA	VT-PTS	
MAJ	338-3172		OSM	GMA	VT-DPA-R	
SPC	338-3125		CHIEF OF STAFF	GMA	VT-CS	
SGT	338-3458		131 ENGR CO	GMA	WP8JAA	
SGT	338-3162		DPA	GMA	VT-DPA-E	
SGT	338-3351		COUNTER DRUG	GMA	VT-CD	
MAJ	338-3336		SAFETY OFFICE	GMA	VT-SOHM	gone to Afganistan

Appendix B
Building Layout



C.J. ARMORY
SECOND FLOOR
N.T.S.

4

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:**	VTGRE197	**Chain Of Custody:**	115805
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	.Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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
0359444	VTGRE197-1	Flame	Wipe	****	0.111	108.00	ug/ft²	300	ug/ft²	
0359445	VTGRE197-2	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359446	VTGRE197-3	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359447	VTGRE197-4	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359448	VTGRE197-5	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359449	VTGRE197-6	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359450	VTGRE197-7	Flame	Wipe	****	0.111	108.00	ug/ft²	260000	ug/ft²	
0359451	VTGRE197-8	Flame	Wipe	****	0.111	108.00	ug/ft²	260000	ug/ft²	
0359452	VTGRE197-9	Flame	Wipe	****	0.111	108.00	ug/ft²	1500	ug/ft²	
0359453	VTGRE197-10	Flame	Wipe	****	0.111	108.00	ug/ft²	260000	ug/ft²	
0359454	VTGRE197-11	Flame	Wipe	****	0.111	108.00	ug/ft²	1900	ug/ft²	
0359455	VTGRE197-12	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	

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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTGRE197	**Chain Of Custody:**	115805
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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

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]

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CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTGRE197	**Chain Of Custody:**	116377
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/18/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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
0363166	VTGRE197-13	Flame	Wipe	****	0.111	108.01	ug/ft²	990	ug/ft²	
0363167	VTGRE197-14	Flame	Wipe	****	0.111	108.01	ug/ft²	170	ug/ft²	
0363168	VTGRE197-15	Flame	Wipe	****	0.111	108.01	ug/ft²	210	ug/ft²	
0363169	VTGRE197-16	Flame	Wipe	****	0.111	108.01	ug/ft²	190	ug/ft²	
0363170	VTGRE197-17	Flame	Wipe	****	0.111	108.01	ug/ft²	210	ug/ft²	
0363171	VTGRE197-18	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0363172	VTGRE197-19	Flame	Wipe	****	0.111	108.01	ug/ft²	120	ug/ft²	
0363173	VTGRE197-20	Flame	Wipe	****	0.111	108.01	ug/ft²	170	ug/ft²	
0363174	VTGRE197-21	Flame	Wipe	****	0.111	108.01	ug/ft²	< 110	ug/ft²	
0363175	VTGRE197-22	Flame	Wipe	****	0.111	108.01	ug/ft²	< 110	ug/ft²	

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]

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	VTGRE198	**Chain Of Custody:**	115916
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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
0362642	VTGRE198-23	Flame	Wipe	****	0.111	108.11	ug/ft²	<	110	ug/ft²	
0362643	VTGRE198-24	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362644	VTGRE198-25	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362645	VTGRE198-26	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362646	VTGRE198-27	Flame	Wipe	****	0.111	108.01	ug/ft²		160	ug/ft²	
0362647	VTGRE198-28	Flame	Wipe	****	0.111	108.01	ug/ft²		170	ug/ft²	
0362648	VTGRE198-29	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362649	VTGRE198-30	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362650	VTGRE198-31	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362651	VTGRE198-32	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362652	VTGRE198-33	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362653	VTGRE198-34	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362654	VTGRE198-35	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362655	VTGRE198-36	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362656	VTGRE198-37	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362657	VTGRE198-38	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362658	VTGRE198-39	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362659	VTGRE198-40	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362660	VTGRE198-41	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362661	VTGRE198-42	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTGRE198	**Chain Of Custody:**	115916
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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
0362662	VTGRE198-43	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362663	VTGRE198-44	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362664	VTGRE198-45	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362665	VTGRE198-46	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362666	VTGRE198-47	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362667	VTGRE198-48	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362668	VTGRE198-49	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362669	VTGRE198-50	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362670	VTGRE198-51	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362671	VTGRE198-52	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362672	VTGRE198-53	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362673	VTGRE198-54	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362674	VTGRE198-55	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362675	VTGRE198-56	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362676	VTGRE198-57	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362677	VTGRE198-58	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362678	VTGRE198-59	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362679	VTGRE198-60	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362680	VTGRE198-61	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362681	VTGRE198-62	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	Job Name:	VTGRE198	Chain Of Custody:	115916
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation Havre de Grace, Maryland 21078	Job Location:	Not Provided	Date Analyzed:	08/15/2003
		Job Number:	Not Provided	Person Submitting:	[redacted]
Attention:	[redacted]	P.O. Number:	07-01	Report Date:	15-Aug-03

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
0362682	VTGRE198-63	Flame	Wipe	****	0.111	108.00 ug/ft²	< 110 ug/ft²	

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]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTAAS282	**Chain Of Custody:**	118711
Address:	301-IR Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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
0402874	VTAAS282 -1	Furnace	Wipe	****	0.111	2.70	ug/ft²	22	ug/ft²	
0402875	VTAAS282 -2	Furnace	Wipe	****	0.111	13.50	ug/ft²	78	ug/ft²	
0402876	VTAAS282 -3	Furnace	Wipe	****	0.111	13.50	ug/ft²	52	ug/ft²	
0402877	VTAAS282 -4	Furnace	Wipe	****	0.111	2.70	ug/ft²	18	ug/ft²	
0402878	VTAAS282 -5	Furnace	Wipe	****	0.111	33.75	ug/ft²	150	ug/ft²	
0402879	VTAAS282 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.35	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] Non-Responsive

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

BEST AVAILABLE COPY

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
RPL			**1.**	

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

Non-Responsive

Analyst

Non-Responsive

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** **GRE**
Date: 197

Sample 1

Sample Number: VTGRE197-A1
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.512	2.446
	2.509	2.458
	2.507	2.449
	2.502	2.456
Average	**2.508**	**2.452**

Average Pre and Post **2.4799**

Time 1	13:43
Time 2	15:20
Total Time Sampled	**1:37**
Minutes Sampled	97.00

Volume **240.55 Liters**

Sample 2

Sample Number: VTGRE197-A2
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.544	2.475
	2.539	2.483
	2.541	2.478
	2.534	2.467
Average	**2.540**	**2.476**

Average Pre and Post **2.5076**

Time 1	13:57
Time 2	15:37
Total Time Sampled	**1:40**
Minutes Sampled	100.00

Volume **250.76 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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Green Mountain Readiness Center
789 Vermont National Guard Road
Colchester, VT 05446

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 21, 2011

AEI Project #: J11-601 4L VT Green Mountain RC

_____

Non-Responsive **CIH, CSP**
Industrial Hygienist

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List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Green Mountain Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Green Mountain Readiness Center located at 789 Vermont National Guard Road, Colchester, VT 05446. Non-Responsive, CIH, CSP performed the evaluation on October 21, 2011. The point of contact for the facility was Non-Responsive " Non-Responsive, the caretaker for the readiness center. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed in the facility. The former firing range was being renovated and layers of old paint were exposed when some boards were removed. The lead check test kit was used to test this layer and found to be positive for lead. The readiness center caretaker called an immediate meeting with the construction contractor and the environmental compliance manager, Ms. Lee Ann Banks, to discuss lead-based paint and dust in the room. It was determined that records of lead testing during and after the conversion of the firing range were available and measures were being taken to control lead dust hazards during the renovation. The firing range had been converted approximately one year ago but had not been used in many years. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for two samples collected from the floor in the former firing range (2,000 – 3,100 µg/ft^2). The recent renovation activities in the former firing range may have disturbed lead-containing dust from building materials that had remained after the conversion.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged insulation was observed in the boiler room, and damaged floor tiles were observed in Room 233 that was under renovation. Bulk samples containing layers of insulation and pipe wrap from the boiler room were analyzed, and no asbestos was detected in any layer. No asbestos was detected in the floor tile or mastic samples from Room 233.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Occasional roof leaks were reported by the caretaker, and a moldy ceiling tile was observed in Room E234.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. Light fixtures were installed too far apart so that light was deficient in between fixtures in some rooms and most hallways. The illumination measurements indoors ranged from 1.7 foot candles (fc) to 168 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 58.6° F and 47.3% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Emergency Eyewash and Shower Maintenance: Plumbed emergency eyewash stations located on sink faucets in the medical department were not being inspected and flushed on a weekly basis in accordance with ANSI Z358.1-2009. Weekly flushing and a general cleaning of the fountains are recommended. An inspection tag or list should be posted nearby to record the weekly flushing.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. This is a large readiness center with several departments with a variety of chemical products including those for maintenance, medical, and kitchen cleaning supplies. MSDSs should be stored near the chemical products and in a central location where they can be accessed at any time. Bleach was being stored next to an ammoniated product in the kitchen. This issue was reported immediately and the products were separated.

Overall, the Green Mountain Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Green Mountain Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Green Mountain Readiness Center located at 789 Vermont National Guard Road, Colchester, VT 05446. Non-Responsive, CIH, CSP performed the evaluation on October 21, 2011. The point of contact for the facility was Non-Responsive " Non-Responsive the caretaker for the readiness center. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The 76,800 square foot, Green Mountain Readiness Center was built in 1989. The operations conducted at the facility include supply, administrative and military medical duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Green Mountain Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Green Mountain facility consist of supply and administrative duties in addition to military medical exams and some medical laboratory tasks. No maintenance of vehicles or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. The former firing range was being renovated and layers of old paint were exposed when some boards were removed. The lead check test kit was used to test this layer and found to be positive for lead. The readiness center caretaker called an immediate meeting with the construction contractor and the environmental compliance manager, Ms. Lee Ann Banks, to discuss lead-based paint and dust in the room. It was determined that records of lead testing during and after the conversion of the firing range were available and measures were being taken to control lead dust hazards during the renovation. The firing range had been converted approximately one year ago but had not been used in many years.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the two samples collected from the floor in the former firing range (2,000 – 3,100 µg/ft^2). The recent renovation activities in the former firing range may have disturbed lead-containing dust from building materials that had remained after the conversion. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG
Green Mountain Readiness Center on October 21, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
GMA – 01	Foyer – floor	<110
GMA – 02	Drill Hall – floor	<110
GMA – 03	Drill Hall – metal safe	<110
GMA – 04	Drill Hall – exercise mats	<110

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Green Mountain Readiness Center

Table 1 – Results of Dust Wipe Sampling for VT ARNG
Green Mountain Readiness Center on October 21, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
GMA – 05	Drill Hall – vending machine	160
GMA – 06	Drill Hall – serving counter	<110
GMA – 07	Kitchen – mixer	<110
GMA – 08	Kitchen – stove	<110
GMA – 09	Hallway – floor	<110
GMA – 10	Maintenance Shop – work bench	150
GMA – 11	Maintenance Shop – floor	<110
GMA – 12	Former Firing Range – bullet trap floor	**3,100**
GMA – 13	Former Firing Range – floor in center	**2,000**
GMA – 14	Room E259 – floor	<110
GMA – 15	Room E260 – floor	<110
GMA – 16	Room E256 – exam chair	<110
GMA – 17	Room E251A – floor	<110
GMA – 18	Room E260 – counter	<110
GMA – 19	Hallway – floor	<110
GMA – 20	Hallway – water fountain	<110
GMA – 21	Conference Room – shelf	<110
GMA – 22	Room E203 – window sill	<110
GMA – 23	Room E203 – floor	<110
GMA – 24	Room E222 – counter	<110
GMA – 25	Room C101 – floor	<110
GMA – 26	Hallway – water fountain	<110
GMA – 27	Band Rehearsal Room – table	<110
GMA – 28	Band Rehearsal Room – storage locker	<110
GMA – 29	Room A129A – water fountain	<110
GMA - 30	Room A124 – floor	<110

*The recommended maximum level for adult exposures is 200 µg/ft^2 lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged insulation was observed in the boiler room and damaged floor tiles were observed in Room 233 that was under renovation. Bulk samples containing layers of insulation and pipe wrap from the boiler room and a floor tile and mastic sample from room E233 were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). No asbestos was detected in any sample.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. The caretaker reported occasional roof leaks, and a moldy ceiling tile was observed in Room E234.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on March 9, 2011, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. Light fixtures were installed too far apart so that light was deficient in between fixtures in some rooms and most hallways. The illumination measurements indoors ranged from 1.7 foot candles (fc) to 168 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in February, 2011. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 66.8 to 73.3° F and 41.9 to 48.9% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 58.6° F and 47.3% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 518 to 813 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.4 to 1.2 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Emergency Eyewash and Shower Maintenance: Plumbed emergency eyewash stations located on sink faucets in the medical department were not being inspected and flushed on a weekly basis in accordance with ANSI Z358.1-2009. Weekly flushing and a general cleaning of the fountains are recommended. An inspection tag or list should be posted nearby to record the weekly flushing.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. This is a large readiness center with several departments with a variety of chemical products including those for maintenance, medical, and kitchen cleaning supplies. MSDSs should be stored near the chemical products and in a central location where they can be accessed at any time. Bleach was being stored next to an ammoniated product in the kitchen. This issue was reported immediately and the products were separated.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling potentially lead-based paints, noise hazards, the presence of damaged asbestos-containing materials and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: accumulated lead-containing dust in the former firing range, a moldy ceiling tile in one room, lighting, hazard communication and MSDS updates and eyewash station maintenance. Overall, the Green Mountain Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

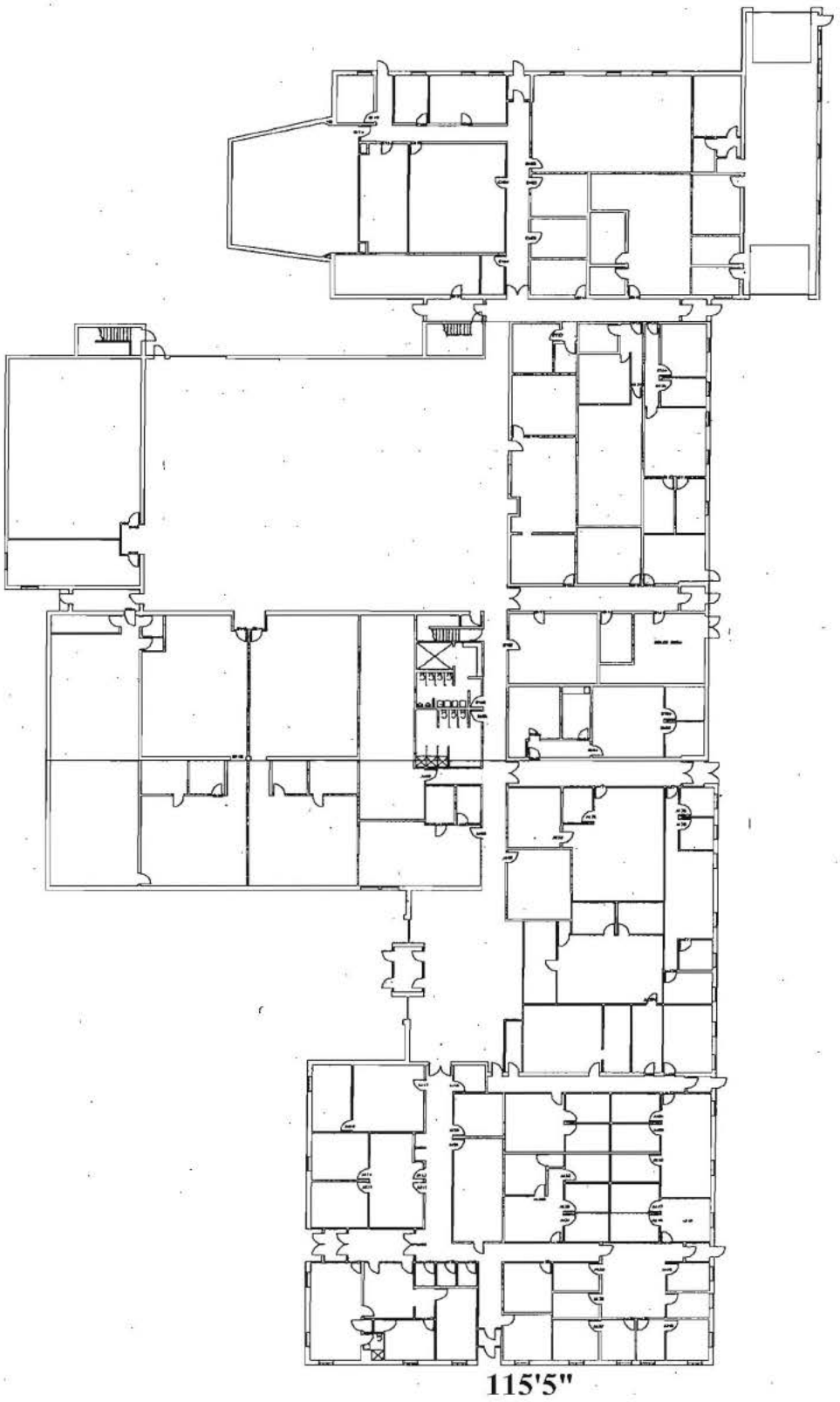
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

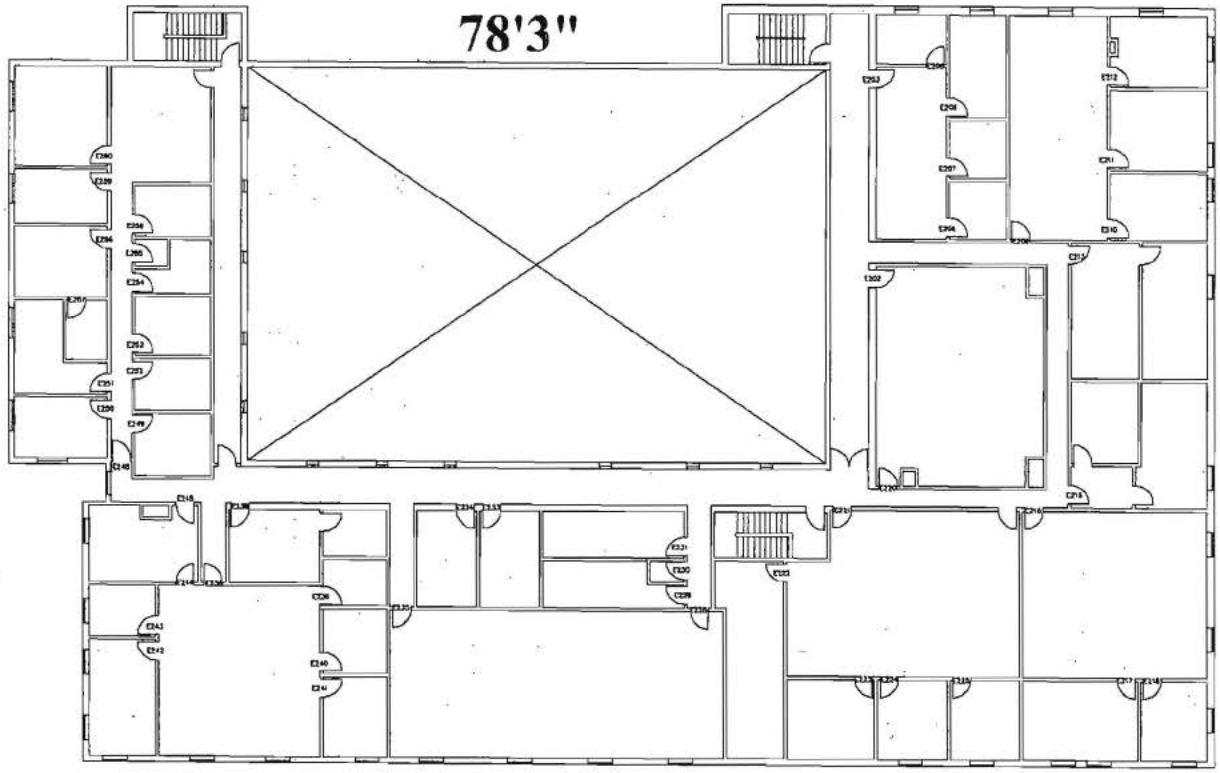
1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 10 October 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 28 March 2009.

8. Army Regulation (AR) 420-1 Army Facilities Management, 28 March 2009.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout



First Floor 1" = 30'



GMA Second Floor

1" = 20'

BEST AVAILABLE COPY

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	Green Mountain Armory	**Chain Of Custody:**	511726		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/5/2011	**Report Date:**	11/7/2011

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
12010483	GMA-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010484	GMA-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010485	GMA-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010486	GMA-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010487	GMA-05	Flame	Wipe	****	0.108	110	ug/ft²	17	160	ug/ft²	
12010488	GMA-06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010489	GMA-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010490	GMA-08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010491	GMA-09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010492	GMA-10	Flame	Wipe	****	0.108	110	ug/ft²	16	150	ug/ft²	
12010493	GMA-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010494	GMA-12	Flame	Wipe	****	0.108	110	ug/ft²	340	3100	ug/ft²	
12010495	GMA-13	Flame	Wipe	****	0.108	110	ug/ft²	210	2000	ug/ft²	
12010496	GMA-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010497	GMA-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010498	GMA-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010499	GMA-17	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010500	GMA-18	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010501	GMA-19	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Green Mountain Armory	**Chain Of Custody:**	511726
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Submitted:**	11/1/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/5/2011 **Report Date:** 11/7/2011

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
12010502	GMA-20	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010503	GMA-21	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010504	GMA-22	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010505	GMA-23	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010506	GMA-24	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010507	GMA-25	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010508	GMA-26	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010509	GMA-27	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010510	GMA-28	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010511	GMA-29	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	
12010512	GMA-30	Flame	Wipe	****	0.108	110 ug/ft²	<12	<110 ug/ft²	

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ISO/IEC 17025:2005
www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Green Mountain Armory	**Chain Of Custody:**	511726		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/5/2011	**Report Date:**	11/7/2011

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.

Non-Responsive

Technical Manager: Non-Responsive

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Green Mountain Armory	**Chain Of Custody:**	511726
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Analyzed:**	11/8/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12010480	GMA-Blk-01	NAD	--	--	--	--	--	--	--	5	--	95	TSI	White	Homogeneous	PC	
12010481	GMA-Blk-02	NAD	--	--	--	--	25	5	--	--	--	70	Fitting	Gray	Homogeneous	PC	
12010482	GMA-Blk-03	NAD	--	--	--	--	--	--	--	--	--	100	FT	Multi	Homogeneous	PC	
12010685	GMA-Blk-03 M	NAD	--	--	--	--	--	--	TR	--	--	100	MS	Yellow	Homogeneous	PC	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Green Mountain Armory	**Chain Of Custody:**	511726
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Analyzed:**	11/8/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

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

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

OWI (410) 247-2024 192202 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) **511726**

page 1 of 3

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: Green Mountain Armory
2. Job Location: Colchester, VT
3. Job #: JII-601 PO #: W912K6-09-A-0003
4. Contact Person: Non-Responsive @ (410) 942-0273
5. Submitted by: Non-Responsive Signature: Non-Responsive

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 Sheet with Report
☐ 24 Hours Time Due:	☐ Next Day ☐ 5 Day +	☐ Email: Non-Responsive ariaenviro.com
Comments:	☐ 2 Day Date Due: 11/8/11	☐ Fax: us.army.mil
	☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)	☐ 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 2 (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 TOX/Ccm) 10 (QTY) ghost (30 total)
☐ 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	DUST	METALS: WIPE (100 cm²)	SPORE TRAP	TAPE	SWAB
GMA-blk-01	GMA bulk	10/21					X									
GMA-blk-02	"	"					X									
GMA-01	" wife			10x10				X								
GMA-02	" "			"				X								
GMA-03	" "			"				X								
GMA-04	" "			"				X								
GMA-05	" "			"				X								
GMA-06	" "			"				X								
GMA-07	" "			"				X								
GMA-08	" "			"				X								
GMA-09	" "			"				X								
GMA-10	" "			"				X								

GMA-blk-03

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: 11/3/11 Contact: JB By: NDM
Sample # GMA-blk-02 Submitted but not listed on COC.
Date/Time: 11/5 Contact: NDM By: JB
See email
Date/Time: Contact: By:
Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 11/1/11 @ 1015 Via: FedEx By (Print): Non-Responsive Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 1952 173 2377

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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)
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) 511726 p 2/3

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: Green Mountain Armory
2. Job Location: Colchester, VT
3. Job #: [redacted] PO #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted By: [redacted] Signature: [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 +
☐ 2 Day Date Due:
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ E-mail: [redacted] ariaenviro.com
☐ Fax: [redacted] us.army.mil
☐ Verbal: [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 10X10) 12 (QTY) (30 total)
- ☐ 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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA (cm)	TEM	PCM	PLM	LEAD	HOLD	AIR	BULK	DUST	WATER	WIPE/SWAB	SPORE TRAP	TAPE	SWAB
GMA-11		10/21		10x10				X									
GMA-12																	
GMA-13																	
GMA-14																	
GMA-15																	
GMA-16																	
GMA-17																	
GMA-18																	
GMA-19																	
GMA-20																	
GMA-21																	
GMA-22																	

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:

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) 511726

p 3/3

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: Green Mountain Armory
2. Job Location: Colchester, VT
3. Job #: 511-601 PO #: W912K6-09-A-0003
4. Contact Pers[redacted] @ phone # (410) 942-0273
5. Submitted By [redacted] ignature: [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 +
☐ 2 Day Date Due: ____
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Include [redacted] with Report.
☒ Email: [redacted] ariaenviro.com
☐ Fax: [redacted] us.army.mil
☐ Verbal: [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 10x10) 8 (QTY) (30 total)
☐ 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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA (cm)	TEM	PCM	PLM	LEAD	HOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
GMA-23		10/21		10x10				X								
GMA-24		↓		↓				↓								
GMA-25		↓		↓				↓								
GMA-26		↓		↓				↓								
GMA-27		↓		↓				↓								
GMA-28		↓		↓				↓								
GMA-29		↓		↓				↓								
GMA-30		↓		↓				↓								

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: ____

Appendix C
Photo Documentation

Green Mountain, VT Readiness Center

Front Lobby

Front Lobby

Front Lobby

Kitchen

Green Mountain, VT Readiness Center

Incorrect storage of chemical products in kitchen

Hallway

Maintenance Office

Drill Hall

Green Mountain, VT Readiness Center

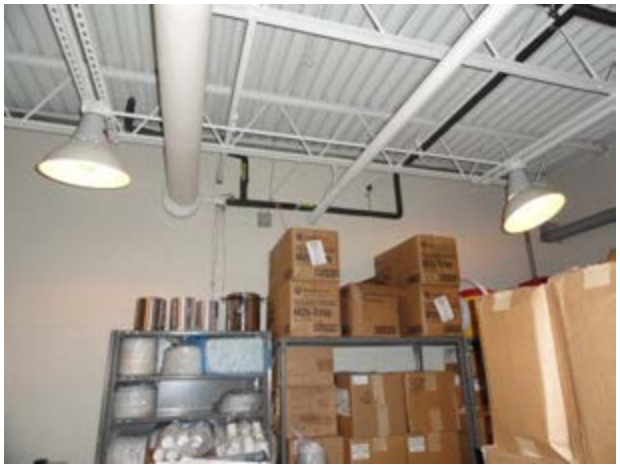
Drill Hall

Drill Hall

Boiler Room – damaged insulation

Boiler Room

Green Mountain, VT Readiness Center



Kitchen Storage

Kitchen Storage

Former Firing Range under renovation

Former Firing Range

Green Mountain, VT Readiness Center

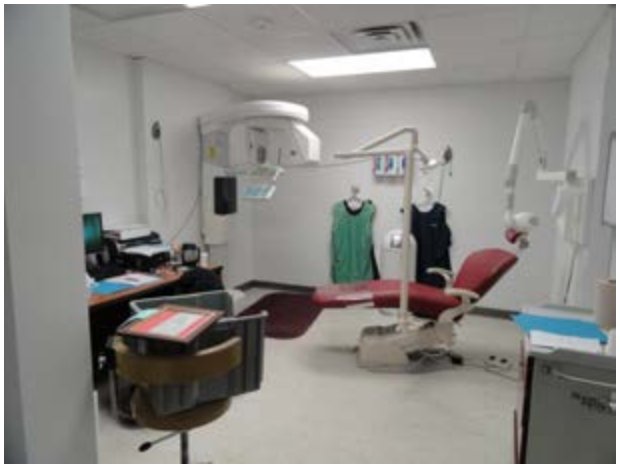
Eyewash station in Medical Department

Medical Laboratory

Medical Exam Room

Another Eyewash Station

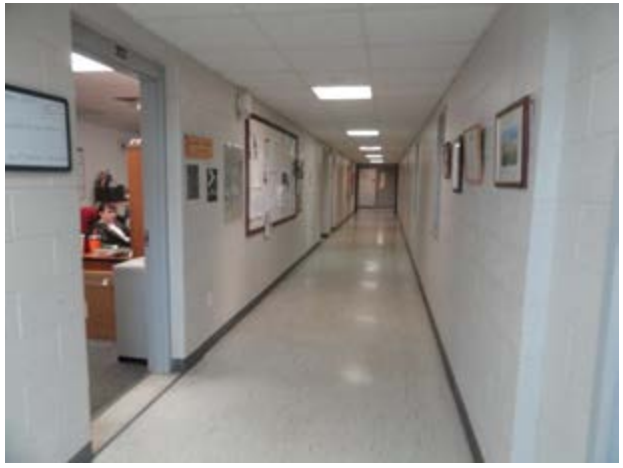
Green Mountain, VT Readiness Center



Dental Room with Xray

Conference Room

Conference Room

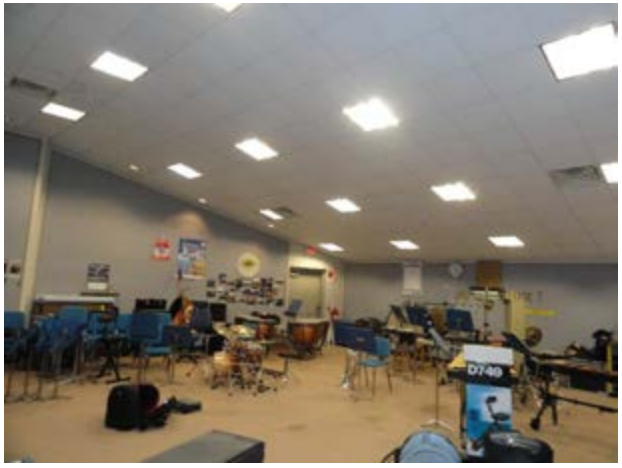


Hallway

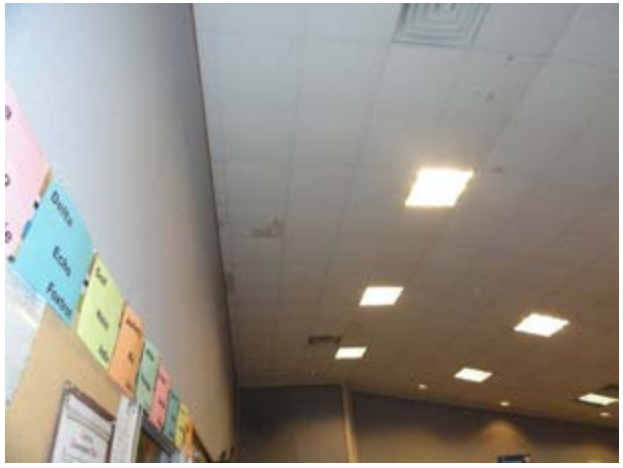
Green Mountain, VT Readiness Center

Break room with server in back

Coffee station in an electrical room



Band practice room



Water Damage on Suspended Ceiling Tiles in Band Room

Green Mountain, VT Readiness Center

Musical Instrument Storage

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Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ							Light		
Date	10/21/2011	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	Green Mountain Armory (GMA)			Serial Number		7565X0839020					Serial Number		K070003
Weather Conditions	Cold, Damp, Cloudy			Last Calibration		Feb-11					Last Calibration		9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Foyer		2	9:12	66.8	X	46.8		530		0.7		10-83		10
Hallway to Drill Hall		1	9:18									2.3-36	X	5
Drill Hall		1	9:20	68.9		48.9		518		1.0		38-65		30-50
Maintenance Room		1	9:59	70.5		47.2		558		0.4		40-60		30-50
Mechanical Room		2	10:02									35-68		30
Locker Room		1	10:08									10-62		7
Supply Room		2	10:09									1.7	X	30
Boiler Room	B114	2	10:26									3-41	X	30
Kitchen Office	B119	2	10:35									2-10	X	30-50
Medical Waiting Room		1	11:16	70.2		42.4		588		0.8		11-45	X	30-50
Med Lab	E260	1	11:18									45-120		30-50
Med Exam Room	E259	1	11:20									50-120		30-50
Dental Xray Room	E256	1	11:28									50-126		30-50
Eye Exam Room	E258	1	11:40									98-168		30-50
Hallway to Exam Rooms		1	11:47									2-57	X	5
Hallway to E235		1	12:15	70.6		45.1		687		0.7		17-30		5
Med Office	E238	8	12:17	71.2		45.2		813		0.8		50-90		30-50
Conference Room	E228	1	12:36	73.3		43.5		638		0.7		35-103		30-50
Stairway		1										10-30		5
Chapel		1										15-35	X	30
Hall near E213		1	12:44									10-49		5
Hall Near E203		1	12:51	72.6		41.9		645		1.2		10-43		5
Office	E203	3										60-132		30-50
Office	E207											60-90		30-50
Office	E213											32-100		30-50
Conference Room	E215B											30-75		30-50

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National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ							Light		
Date	10/21/2011	Inspector	[redacted]	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	Green Mountain Armory (GMA)			Serial Number		7565X0839020					Serial Number		K070003
Weather Conditions	Cold, Damp, Cloudy			Last Calibration		Feb-11					Last Calibration		9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceede	RH (%)	Exceede	CO_2 (ppm)	Exceede	CO (ppm)	Exceede	Illuminance (fc)	Insufficier	Illuminance Reference (fc)
HR Office	E221											30-44		30-50
Break Room and Server Room	E222											10-92	X	30
Electrical Room	C101											25-35	X	30
Hall Near C101												2-42	X	5
Office	C105A											62-118		30-50
Office	C105B											30-138		30-50
Band Rehearsal Room												22-30	X	30-50
Band Instrument Room	C110											14-52	X	30-50
A118 Hallway												4-43		5
Outside			13:38	58.6		47.3		415		1.8				

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Industrial Hygiene Survey

Vermont Army National Guard (VTARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Green Mountain Readiness Center
789 Vermont National Guard Road
Colchester, VT 05446

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 19, 2012

AEI Project #: J12-685 3m VT Green Mountain RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Green Mountain Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Green Mountain Readiness Center located at 789 Vermont National Guard Road, Colchester, VT 05446 Non-Responsive, CIH, CSP performed the evaluation on October 19, 2012. The point of contact for the facility was LTC Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed in the facility. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot ($\mu g/ft^2$)) in all areas sampled.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect asbestos-containing materials were observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Evidence of water intrusion was observed in the form of stained ceiling tiles, moisture fogged windows and water damaged wooden window sills.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable. Most areas were clean and tidy.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. Light fixtures were installed too far apart so that light was deficient in between fixtures in some rooms and most hallways. The illumination measurements indoors ranged from 5 foot candles (fc) to 200 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 63.3° F and 64.4% on the day of monitoring. CO_2 measurements were below the guideline in all areas monitored except for office B159 (1,112 ppm) where three people were working with no central ventilation and in the newly built Recruiting and Retention offices where concentrations ranged from 1,046 to 1,257 ppm. On average CO_2 concentrations were about 600 ppm in the rest of the building even in areas where there was no mechanical ventilation; therefore, this newly built section may have a problem with ventilation balancing or fresh air exchange. Carbon monoxide concentrations were below the guidelines in all areas sampled. An odor issue was reported in Office Suite A174 due to newly installed carpeting. This office suite has no mechanical ventilation; therefore, odors from new building materials will accumulate over time as they off-gas especially since the windows are closed due to the colder weather.

Emergency Eyewash and Shower Maintenance: Plumbed emergency eyewash stations located on sink faucets in the medical department were not being inspected and flushed on a weekly basis in accordance with ANSI Z358.1-2009. Weekly flushing and a general cleaning of the fountains are recommended. Inspection tags were not up to date.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. This is a large readiness center with several departments with a variety of chemical products including those for maintenance, medical, and kitchen cleaning supplies. MSDSs should be stored near the chemical products and in a central location where they can be accessed at any time.

Overall, the Green Mountain Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Green Mountain Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Green Mountain Readiness Center located at 789 Vermont National Guard Road, Colchester, VT 05446. Non-Responsive, CIH, CSP performed the evaluation on October 19, 2012. The point of contact for the facility was LTC Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The 76,800 square foot, Green Mountain Readiness Center was built in 1989. The operations conducted at the facility include supply, administrative and military medical duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Green Mountain Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Green Mountain facility consist of supply and administrative duties in addition to military medical exams and some medical laboratory tasks. No maintenance of vehicles or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. The former firing range was renovated within the last year and is now a sound proof practice and recording area for the military band. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum in all areas sampled. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VTARNG Green Mountain Readiness Center on October 19, 2012.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
GMA – W01	Drill Hall – center of floor	<110
GMA – W02	Drill Hall – floor near former range	<110
GMA – W03	Drill Hall – dusty blue floor mat	<110
GMA – W04	Drill Hall – serving counter	<110
GMA – W05	Drill Hall – water fountain	<110
GMA – W06	Drill Hall – tray return	<110
GMA – W07	1st Floor Hallway – floor in recycling area	<110
GMA – W08	1st Floor Hallway – floor near construction	<110
GMA – W09	1st Floor Former IFR – Band Practice Room - table	<110
GMA – W10	1st Floor Former IFR – Band Practice Room – hallway treated concrete floor	<110

Table 1 – Results of Dust Wipe Sampling for VTARNG Green Mountain Readiness Center on October 19, 2012.

Wipe Sample #	Sample Location	Result (µg/ft²)*
GMA – W11	1st Floor Former IFR – Band Practice Room – B156 – untreated concrete floor	<110
GMA – W12	C115 Band Room – small white table	<110
GMA – W13	C115 Band Room – return grill	<110
GMA – W14	New Recruiting and Retention Area – hallway floor	<110
GMA – W15	New Recruiting and Retention Area – lobby floor	<110
GMA – W16	2nd Floor E228 Conference Room – window sill	<110
GMA – W17	2nd Floor E228 Conference Room – table	<110
GMA – W18	2nd Floor E260 Med Lab – counter	<110
GMA – W19	2nd Floor E259 Exam Room – counter	<110
GMA – W20	2nf Floor E256 Dental Office - floor	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect asbestos-containing materials were observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Evidence of water intrusion was observed in the form of stained ceiling tiles, moisture fogged windows and water damaged wooden window sills.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was acceptable. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed throughout the readiness center. The evaluation indicated illumination deficiencies in several areas. Light fixtures were installed too far apart so that light was deficient in between fixtures in some rooms and most hallways. The illumination measurements indoors ranged from 5 foot candles (fc) to 200 fc. The complete results of the

evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7565X, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 68.1 to 74.5° F and 43.5 to 69.0% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 63.3° F and 64.4% on the day of monitoring and it was raining.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 376 to 1,257 parts per million (ppm) and the outdoor concentration was 355 ppm. CO_2 measurements were below the guideline in all areas monitored except for office B159 (1,112 ppm) where three people were working with no central ventilation and in the newly built Recruiting and Retention offices where concentrations ranged from 1,046 to 1,257 ppm. On average CO_2 concentrations were about 600 ppm in the rest of the building even in areas where there was no mechanical ventilation; therefore, this newly built section may have a problem with ventilation balancing or fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking

lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 0.5 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Odor Issue
An odor issue was reported in Office Suite A174 due to newly installed carpeting. This office suite has no mechanical ventilation; therefore, odors from new building materials will accumulate over time as they off-gas especially since the windows are closed due to the colder weather.

Additional Information

Emergency Eyewash and Shower Maintenance: Plumbed emergency eyewash stations located on sink faucets in the medical department were not being inspected and flushed on a weekly basis in accordance with ANSI Z358.1-2009. Weekly flushing and a general cleaning of the fountains are recommended. Inspection tags were not up to date.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. This is a large readiness center with several departments with a variety of chemical products including those for maintenance, medical, and kitchen cleaning supplies. MSDSs should be stored near the chemical products and in a central location where they can be accessed at any time.

7 Conclusions

The results of the evaluation indicated few concerns with the facility. Overall, the Green Mountain Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

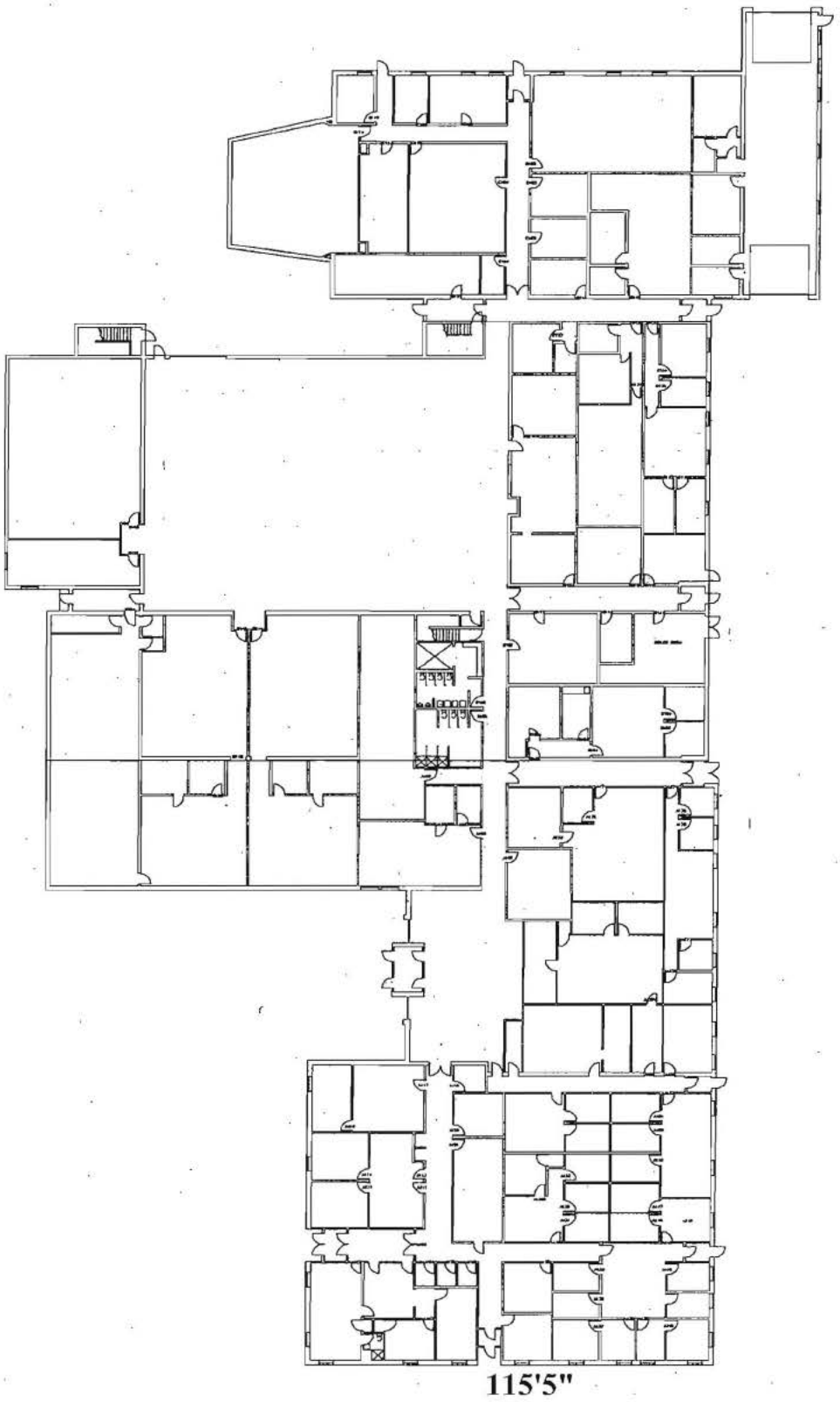
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these

findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

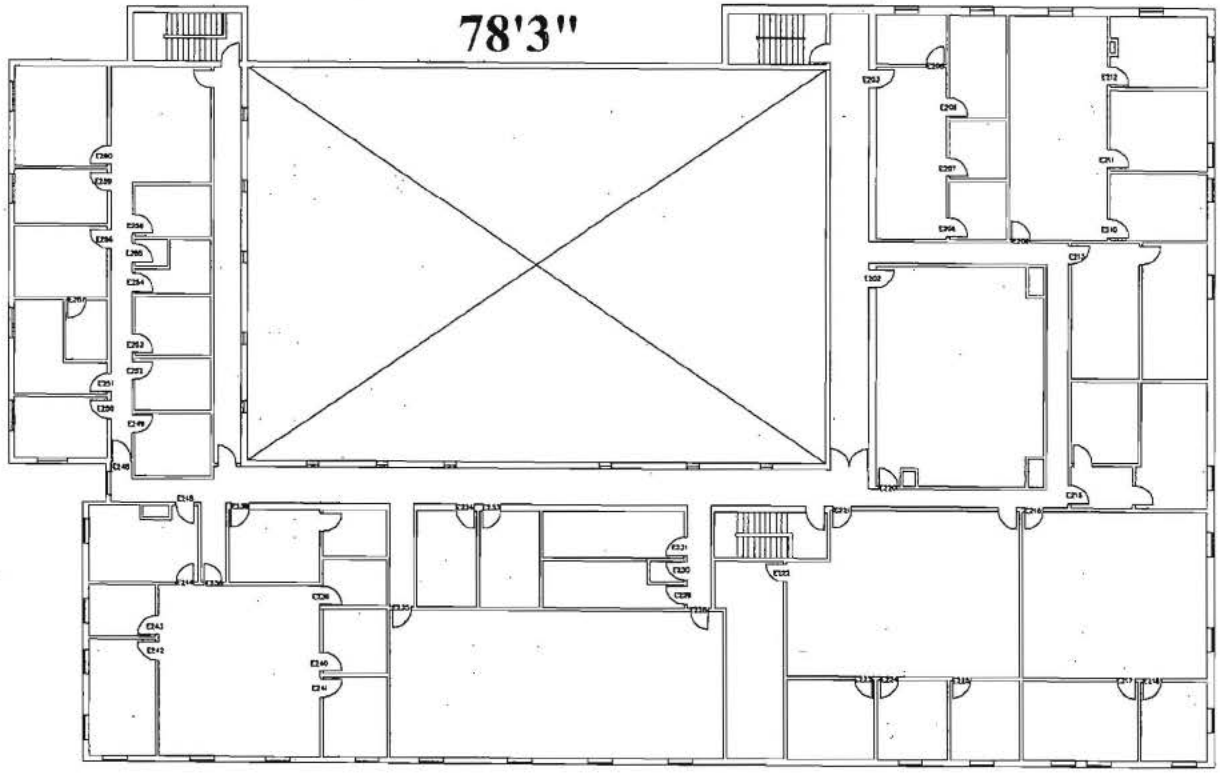
9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.
19. ANSI Z358.1 – 2009, Emergency Eyewash and Shower Equipment.

Appendix A
Building Layout



First Floor 1" = 30'



GMA Second Floor

1" = 20'

BEST AVAILABLE COPY

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	GMA	**Chain Of Custody:**	514367
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/9/2012

Report Date: 11/12/2012

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
13010616	GMA-W 01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010617	GMA-W 02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010618	GMA-W 03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010619	GMA-W 04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010620	GMA-W 05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010621	GMA-W 06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010622	GMA-W 07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010623	GMA-W 08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010624	GMA-W 09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010625	GMA-W 10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010626	GMA-W 11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010627	GMA-W 12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010628	GMA-W 13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010629	GMA-W 14	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010630	GMA-W 15	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010631	GMA-W 16	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010632	GMA-W 17	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010633	GMA-W 18	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010634	GMA-W 19	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	

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:**	GMA	**Chain Of Custody:**	514367
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Colchester, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/9/2012
Attention:	Non-Responsive			**Report Date:**	11/12/2012

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
13010635	GMA-W 20	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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

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 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: 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)

514367

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: GMA
2. Job Location: Colchester, VT
3. Job #: J12-085 P.O. #: W912K6-09-A-0003
4. Contact Perso[redacted] @ phone #
5. Submitted by: [redacted] ature: [redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day ❑ Results Required By Noon	☒ Include [redacted] with Report
❑ 24 Hours Time Due:	❑ Next Day ☒ 5 Day +	☒ Email: [redacted] @ ariaenviro.com
Comments:	❑ 2 Day Date Due: 11/16 11/14	❑ Fax: [redacted] @us.army.mil
		❑ Verbals [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)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ❑ Pb Paint Chip (QTY)
- ☒ *Pb Dust Wipe (wipe type 10x10 cm) 20 (QTY) ghost
- ❑ *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 CONTACT (LABORATORY STAFF ONLY)
CLIENT ID #	SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	
																Date/Time: Contact: By:
SEE ATTACHED FIELD DATA SHEETS																
																Date/Time: Contact: By:
																Date/Time: Contact: By:

[redacted]

[redacted]

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 11/2/12 @ Via: Fedex By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 857 2722 0912

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10-19-12

Job Site: J12-685

Project No.: GMA

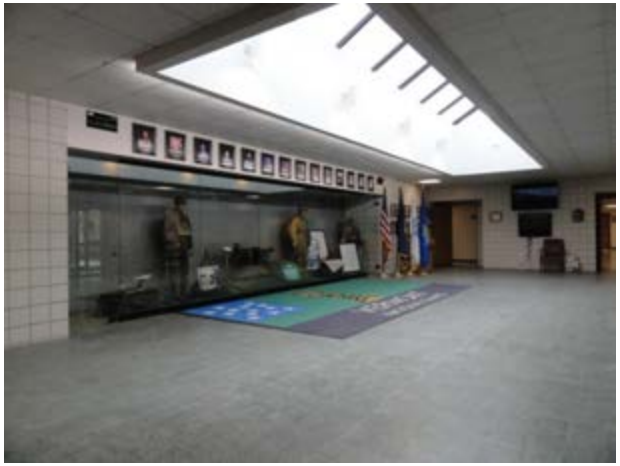
Inspector: Non-Responsive [redacted]

10 X 10 cm

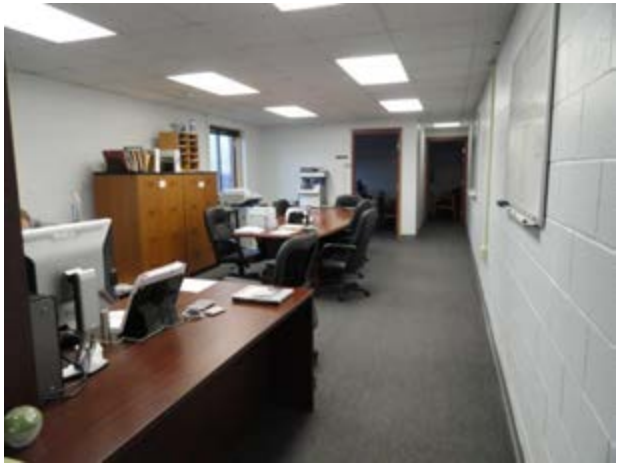
Sample No.	Sample Type	Sample Location	Dimensions (Area)
GMA-W01	Lead	Drill Hall - floor counter	
W02		Drill Hall - floor near former range	
W03		Drill Hall - dusty blue floor mat	
W04		Drill Hall - serving counter	
W05		Drill Hall - water fountain	
W06		Drill Hall - tray return	
W07	1st Fl	Hallway (recycling + trash area) - floor	(Construction workers egress)
W08	1st Fl	Hallway near construction containment	
W09	1st Fl	former IFR - Band Practice Room B166 - table	
W10	"	" - " - Hallway floor treated conc.	
W11	"	" - " - B156 floor untreated conc.	
W12	"	C115 Band Room - small white table	
W13	"	C115 Band Room - return grill	
W14	"	R+R Battalion Area - floor - hallway	
W15	"	R+R Battalion Area - floor - Lobby	
W16	2nd Fl	E228 Conf Room - window sill	
W17	"	E228 Conf Room - table	
W18	"	E260 Med Lab - Counter	
W19	"	E259 Exam Room - Counter	
W20	"	E256 Dental - floor (VCT)	

Appendix C
Photo Documentation

VT Green Mountain Armory (GMA)



Lobby

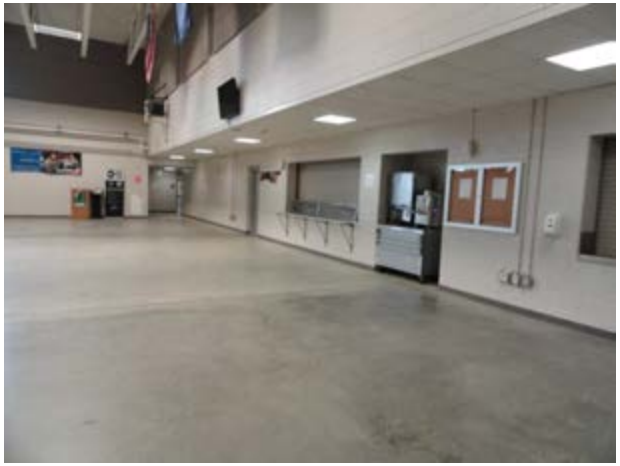


JFHQ Office Suite

JFHQ Office Suite

Drill Hall

VT GMA



Drill Hall

Janitor's Closet

Drill Hall

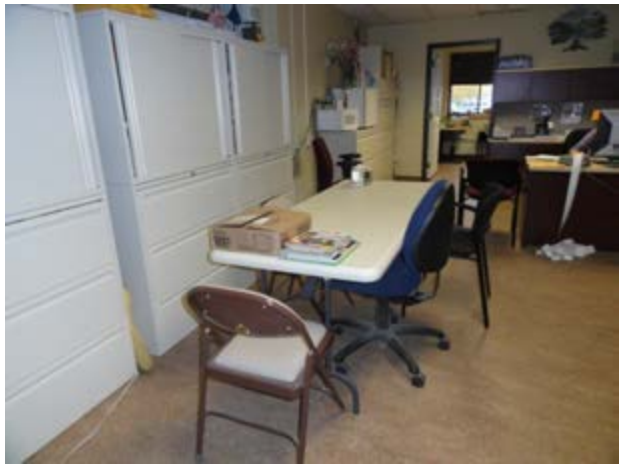
Trash and Recycling in Hallway

VT GMA

Containment near area being renovated

Containment does not go to floor to prevent dust from entering hallway

Storage Area near Drill Hall



Human Resources Office

VT GMA

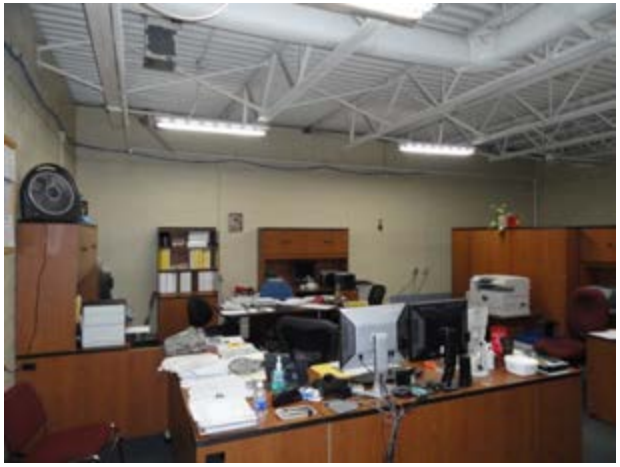
Renovated area

Offices near Drill Hall

Offices and storage near Drill Hall

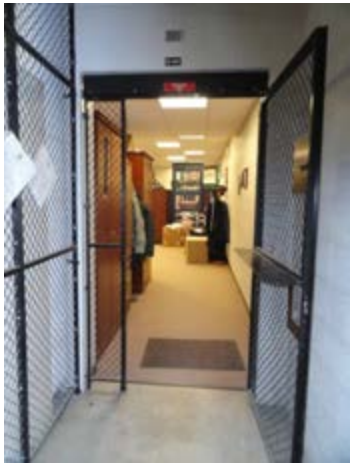
Storage Area

VT GMA



Office

Office



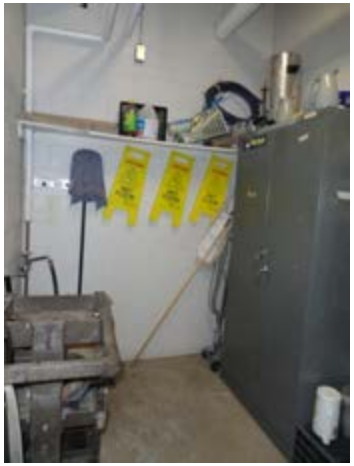
Storage and Office area

Funeral Services Office

VT GMA

Supply Office

Janitor's closet with a coffee station



Janitor's closet

Band Office

VT GMA

Band Instrument storage room

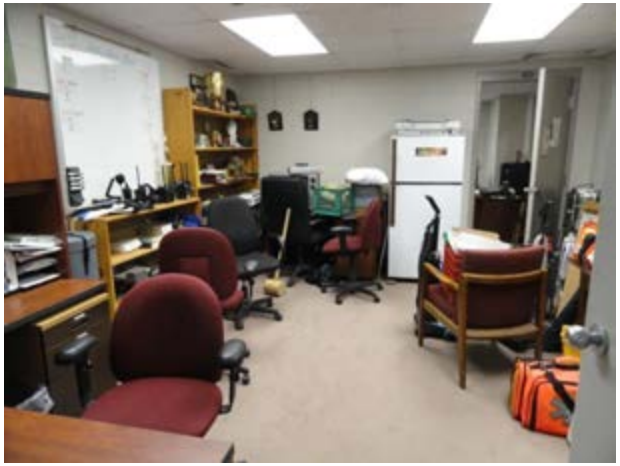
Kitchenette in Band Storage Room

Band Room

Stained Ceiling Tiles in Band Room

VT GMA

Band Room



Band Offices

Stained Ceiling tiles in Band offices

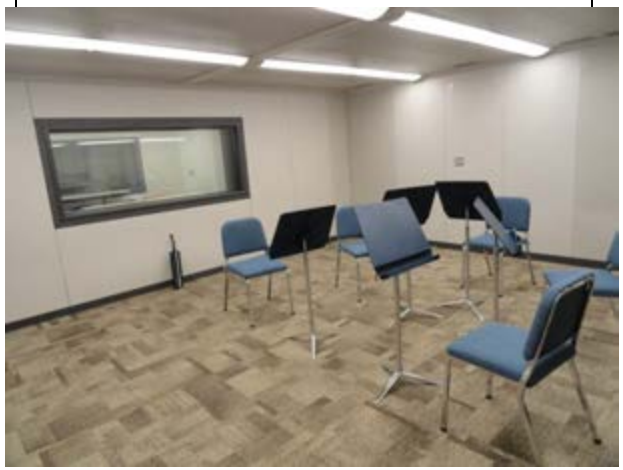
Recording area

VT GMA

Stained Ceiling Tiles

Newly Installed Band Practice Room

Newly Installed Band Practice Room



Newly Installed Band Practice Room

VT GMA

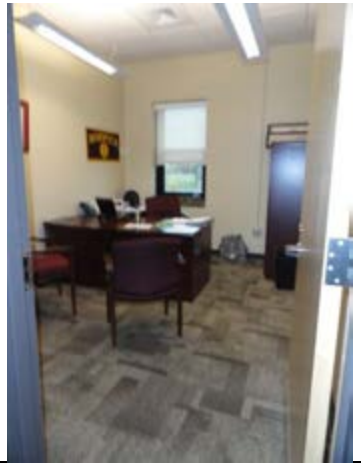
Newly Installed Band Practice Room

Newly Installed Band Practice Room

VT GMA

Newly Installed Band Practice Room

Lobby in Recruiting Area



Office

Conference Room

VT GMA

Boiler Room

Electrical Closet

Janitor's Closet

Hallway

VT GMA

Lobby

Office

Conference Room

Office

VT GMA

Conference Room

Office Suite

Janitor's Closet

Electrical Closet with blocked panel

VT GMA

Stained Ceiling Tiles

Stained Ceiling Tiles

Classroom

Stained Ceiling Tiles

VT GMA

Stained Ceiling Tiles

2nd Floor Hallway

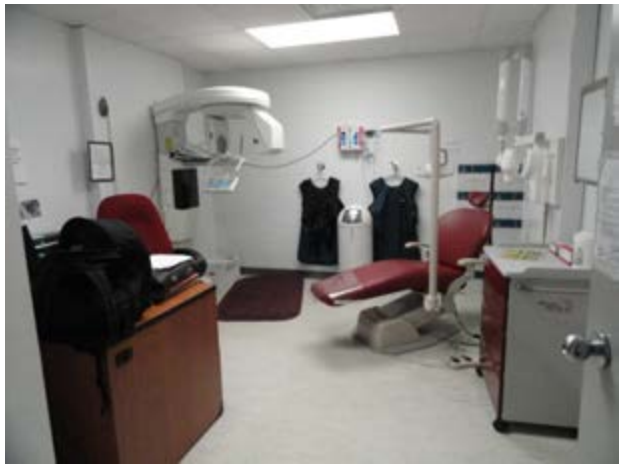
Stained Ceiling Tile

VT GMA

Stained Ceiling Tiles

Medical Office

Janitor's Closet with Medical Supplies and Cleaning Products



Dental Office

VT GMA

Dental Office Storage

Medical Exam Room

Eyewash Station

Medical Exam Room

VT GMA

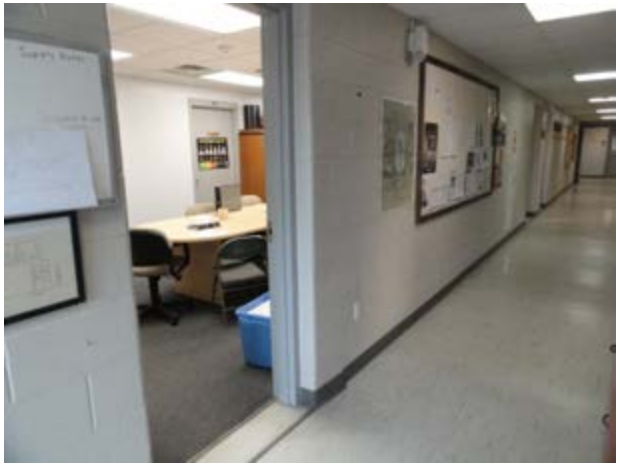
Medical Lab

Eyewash Station in Lab

Medical Lab

Window with water intrusion

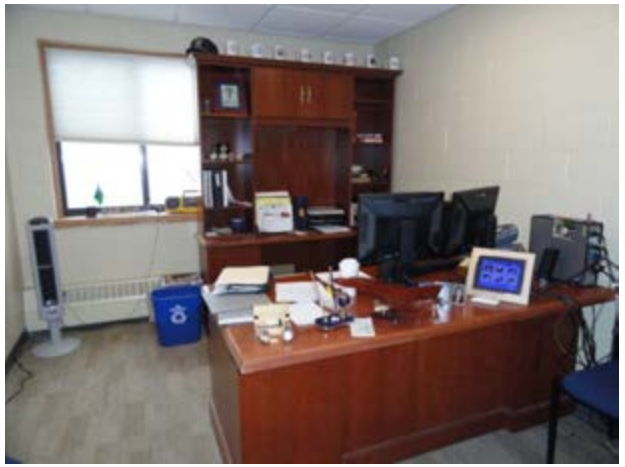
VT GMA



Office Suite

Office Suite Conference Table

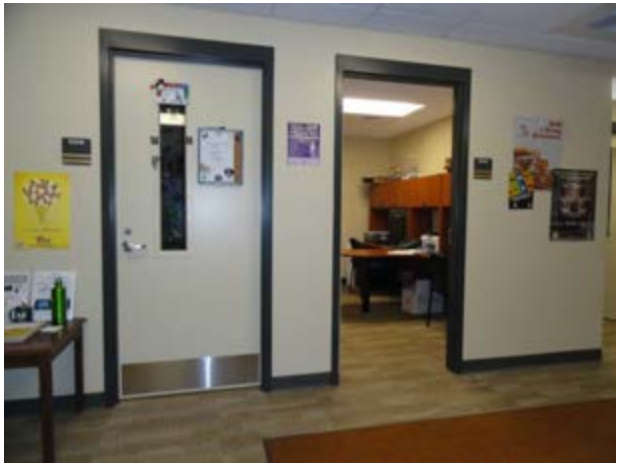
Office



Office

VT GMA

Break Room



Human Resources Office

Chapel

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ							Light		
Date	10/19/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	GMA			Serial Number		7565X0839019					Serial Number		K070003
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Lobby		1	0918	68.8		53.0		480		0.5		11-184		10
A174 Suite		2	0922	70.3		45.0		705		0.2		50-165		30-50
A177 Office		1	0923	70.4		45.4		713		0.2		30-126		30-50
A178 Office		1	0923	70.5		43.5		681		0.2		30-130		30-50
B110 Janitor's Closet		1	0925									18	X	30
Drill Hall		2	0933	71.2		52.3		689		0.2		30-75	X	50
B161 Storage		1	0957									18-55		10
B159 HRO Suite		3	0958	72.0		51.5		1112	X	0.5		50-100		30-50
B154 New Office		1	1002	71.4		49.9		575		0.2		18-56	X	30-50
B148 Vault Storage		1	1005									30-71		30
B149 Office		2	1007	70.5		48.4		516		0.1		17-70	X	30-50
B150 Office Supplies		2	1010									7-128	X	10
B144 Storage Lockers		1	1011									30-50		30
B145 Office		2	1012	71.9		48.0		605		0.0		50-80		30-50
B169 Storage and Office		5	1013	72.3		50.0		558		0.2		18-35	X	30
C101 Janitor's Closet		1	1015									41		30
C103 Office		1	1020									30-80		30-50
C105A Office		5	1021	74.1		50.4		788		0.1		50-150		30-50
C105B		3	1022									30-137		30-50
C108 Office		1	1023									40-180		30-50
C110 Storage		1	1024	73.4		44.5		567		0.0		30-104		30
C115 Band Room		1	1026	69.7		50.6		424		0.1		16-37	X	30-50
C114 Sound Room		1	1028									70-144		30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ								Light		
Date	10/19/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400
Facility Description	GMA			Serial Number		7565X0839019						Serial Number		K070003
Weather Conditions				Last Calibration		Mar-12						Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	**Exceeded**	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
C113 Office		1	1032	70.2		50.7		448		0.1		80-175		30-50
B154 Band Practice Suite		1	1035									5-65	X	30-50
B167 Large Practice Area		1	1036	68.1		54.0		382		0.1		30-55		30-50
B166 Sound Room		1	1040	68.1		49.7		406		0.1		100-120		30-50
B165 Small Practice Area		1	1044	68.7		48.0		376		0.0		85-110		30-50
R&R Battery Lobby/Waiting Area		2	1110	71.7		51.9		1140	X	0.1		54-65		10
D191 Office		2	1112	71.7		52.1		1216	X	0.2		40-60		30-50
D195 Office		2	1113	71.8		53.3		1046		0.1		40-70		30-50
D197 ID Office		5	1114	71.6		53.8		1257	X	0.2		60-70		30-50
D196 Office		1	1115	71.3		52.6		1233	X	0.2		30-60		30-50
D194 Office		3	1116	71.7		53.6		1218	X	0.2		40-60		30-50
D192 Office		2	1116	72.2		52.5		1170	X	0.1		35-72		30-50
D189 Office		2	1117	72.1		51.7		1161	X	0.1		50-77		30-50
D190 Office		3	1118	72.1		52.2		1217	X	0.3		48-78		30-50
D188 Office		3	1118	72.0		52.5		1232	X	0.1		33-65		30-50
D183 Print Room		1	1122	72.2		52.2		1171	X	0.1		40-58		30-50
D182 Office		3	1123	72.5		53.1		1227	X	0.2		30-80		30-50
B134 Office		1	1129	72.2		48.5		759		0.2		70-145		30-50
B135 Office		1	1129	72.5		48.0		765		0.1		86-150		30-50
B135 Conference Room		1	1130	71.1		46.9		677		0.2		30-140		30-50
B136 Office		1	1131									30-113		30-50
B137 Office		1	1131									30-70		30-50
B130 Office Suite		1	1132	73.1		45.8		750		0.1		30-117		30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ							Light		
Date	10/19/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	GMA			Serial Number		7565X0839019					Serial Number		K070003
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
A160 Office		1	1146	70.2		52.0		532		0.0		40-160		30-50
A159 Office		3	1147	70.6		52.9		697		0.1		40-200		30-50
A156A Office Suite		5	1148	71.5		51.1		636		0.1		18-108	X	30-50
A156B Office Suite		2	1150									15-86	X	30-50
A156C Office Suite		2	1153									50-100		30-50
A156D Conference Room		1	1155									30-50		30-50
A156E Office		1	1200	72.7		48.9		665		0.1		30-150		30-50
A117 Office Suite		2	1212	70.3		52.2		522		0.2		30-130		30-50
A116 Office		1	1212	70.1		51.2		497		0.2		30-120		30-50
Break Room Kitchenette		1	1213	70.0		52.8		515		0.1		80-120		15
A120 Office		1	1214	69.8		51.4		482		0.1		60-120		30-50
A121 Conference Room		1	1220	68.1		56.6		595		0.1		8-83	X	30-50
A103 Office		1	1222	68.4		53.4		525		0.1		30-80		30-50
A110 Office		1	1225	68.9		52.0		549		0.1		40-116		30-50
A107 Office		4	1226	69.1		54.5		705		0.1		30-119		30-50
A108 Office		1	1226	69.0		52.3		535		0.1		30-107		30-50
A134 Suite		2	1228	70.1		53.5		590		0.0		30-150		30-50
A138 Office		1	1229									30-135		30-50
A137 Office		2	1230	70.8		52.3		743		0.0		80-130		30-50
A139 Office		1	1231									125		30-50
A145 Suite		1	1232	71.0		50.6		541		0.0		50-165		30-50
A149 Conference Room		1	1233	70.7		50.9		539		0.1		40-112		30-50
A165 Office Suite		1	1240									80-165		30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ							Light		
Date	10/19/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	GMA			Serial Number		7565X0839019					Serial Number		K070003
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
E227 Electrical Closet		1	1242									60-70		30
E228/E235 Class/Conference Room		1	1242									35-52		30-50
E234 Office		2	1243	72.6		69.0	X	559		0.2		30-99		30-50
E236 Office		2	1256	74.2		50.6		759		0.0		60-125		30-50
E237 Office		0	1257									145		30-50
E238 Office		5	1303	72.8		49.9		583		0.1		50-150		30-50
E249 Office		3	1308	74.4		51.6		736		0.0		80-150		30-50
E250 Office		2	1309	74.5		50.4		713		0.1		60-150		30-50
E251 Office		3	1310	74.2		49.9		695		0.1		30-110		30-50
E251A Break Area		1	1318									130		15
E253 Office		1	1318	73.8		49.8		610		0.1		50-100		30-50
E255 Janitor's & Electrical Closet		1	1319									30		30
E256 Dental		1	1320									105		30-50
E258 Vision		1	1321									150		30-50
E259 EKG & Vitals		1	1322	73.5		50.9		664		0.1		50-115		30-50
E260 Lab		1	1323	73.5		49.9		624		0.0		30-109		30-50
Waiting Room		1	1323	73.5		50.2		631		0.0		10-46		10
E252 Hearing		1	1334	73.8		52.2		676		0.1		50-70		30-50
E203 Office Suite		1	1336	73.5		49.5		438		0.1		70-160		30-50
E213A Office		1	1338	73.3		48.1		478		0.1		90-128		30-50
E213 Office		2	1338	73.7		49.3		530		0.1		80		30-50
E215A Office		1	1340	73.4		46.5		485		0.1		30-50		30-50
E216 Suite		1	1341	73.7		49.5		523		0.1		50		30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Colchester	IAQ							Light		
Date	10/19/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	GMA			Serial Number		7565X0839019					Serial Number		K070003
Weather Conditions				Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
E2116D Office		1	1341	73.8		50.7		520		0.0		50-70		30-50
E218 Office		1	1342	73.5		48.7		623		0.1		30-56		30-50
E2116E Office		1	1342	73.1								30-70		30-50
E217 Office		1	1348	73.1		46.0		627		0.0		30-50		30-50
E225 Office		1	1348									30-45		30-50
E219 Office		2	1350	73.4		50.7		525		0.0		30-80		30-50
HRO Main Entrance		1	1352	73.5		49.2		646		0.1		30-50		30-50
Break Room		1	1355									30-50		30-50
E220 Chaplin's Room		1	1358	73.3		49.2		736		0.1		10-42		5
Outside			1402	63.3		64.4		355		0.2				

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Shaw® Shaw Environmental, Inc.

National Guard Armory
Lyndonville Readiness Center – Lyndonville, Vermont

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

11 December 2003

National Guard Armory
Lyndonville Readiness Center – Lyndonville, Vermont

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

11 December 2003

Prepared by: Non-Responsive
Industrial Hygienist

Reviewed by: Non-Responsive
Business Line Manager

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Executive Summary

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Lyndonville Readiness Center in Lyndonville, Vermont Non-Responsive Non-Responsive performed the evaluation on 29 July 2003 and 7 October 2003. The point of contact at the readiness center was SGT 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
- Indoor Air Quality

- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed a concentration above the recommended level at one location in the assembly room (the fire alarm control box top surface). It is recommended that the fire alarm control box top surface and the area immediately around the fire alarm control box top surface be cleaned thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall and the 1st floor (flammable cabinet top and office heating vent). 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.
- 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 two locations at the armory. The source of the water damage was likely from roof leaks. The source of the water should be confirmed 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 minimum requirements in many areas; therefore consideration should be given to providing more lighting in these areas. 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.
- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at all of the locations sampled. These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. In addition, employees

should not be allowed to work in these areas without protective clothing until the areas are cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Lyndonville Readiness Center in Lyndonville, Vermont. Non-Responsive Non-Responsive performed the evaluation on 29 July 2003 and 7 October 2003. The point of contact at the readiness center was SGT 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 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 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/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 hall. If there were any positive results from the drill floor, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at one location. The assembly hall fire alarm control box top surface had a lead concentration of 830 $\mu g/ft^2$. It is recommended that fire alarm control box surface and the immediate areas around the fire alarm control box be thoroughly cleaned to reduce the lead level. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

Wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the assembly hall and the 1st floor (flammable cabinet top and office heating vent). 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 one (1) full-time building occupant. (Please note that no state employees were monitored.) In addition, a general air sample was collected in the converted firing range. The samples were taken 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 and in the general area of the converted firing range; 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 material was floor tiles in the kitchen and two kitchen storage rooms (approximately 800 square feet) and insulation in the boiler room (approximately 39 linear feet). The condition of the floor tiles materials was considered average since there was some damage to tiles at the doorways. The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage).

An operation 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 in the classroom on the second floor in the form of stained ceiling tiles and in the men's latrine on the ceiling above the shower.

The source of the water damage was likely from roof leaks. The source of the water damage should be confirmed 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 and observation of work activities revealed no ergonomic concerns at the armory.

2.2.4 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 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 the HAZCOM program was the only program listed above that was applicable at the facility. HAZCOM program was evaluated and it was determined that the program 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 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 4. As can be seen from the results, the lighting did not meet the minimum requirements in many areas, including the COB DET FSB RNCO Office, supply room office area, and kitchen.

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 converted range. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- floor outside the range at 790 micrograms lead per square foot ($\mu g/ft^2$);
- bullet trap floor at 17000 $\mu g/ft^2$;
- light fixture at 3800 $\mu g/ft^2$;
- floor at 1000 $\mu g/ft^2$;
- stored item -- locker top at 1000 $\mu g/ft^2$;
- inside remaining ventilation ductwork at 6400 $\mu g/ft^2$; and
- storage room (separate room) at 1300 $\mu g/ft^2$.

The lead levels at these locations were above 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). These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas are cleaned and re-sampled.

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 lead-based paint, indoor air quality, visible mold, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, water damage, surface lead contamination in the converted firing range, 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

Lyndonville, Vermont

Date of Sampling: 29 July 2003 and 7 October 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTLYN209-1	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTLYN209-2	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTLYN209-3	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTLYN209-4	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTLYN209-5	Drill Floor – On Floor (See Building Layout – Appendix B)	130
VTLYN209-6	Field Blank	<12 µg
VTLYN209-15	1st Floor Co. D Supply Television Top	14
VTLYN209-16	1st Floor Kitchen Dough Mixer Top	5.4
VTLYN209-17	1st Floor Co B Det FSB RNCO Office Desktop	23
VTLYN209-18	Field Blank	<0.3 µg
VTLYN209-19	1st Floor Flammable Cabinet Top	130
VTLYN209-20	1st Floor Recruiting Office Desktop	<2.7
VTLYN209-21	1st Floor Training Office Heating Vent	120
VTLYN209-22	1st Floor Desktop	6.5
VTLYN209-23	2nd floor classroom table top	7.9
VTLYN209-24	Field Blank	<0.3 µg
VTLYN281-1	Assembly Hall (Soda Machine Top Surface)	90
VTLYN281-2	Assembly Hall (Locker Top Surface)	78

(Continued)

Table 1 (Continued)
Wipe Sampling for Lead
National Guard Armory
Lyndonville, Vermont
Date of Sampling: 29 July 2003 and 7 October 2003

Sample Number	Location	Results, µg/ft^2 [a]
VTLYN281-3	Assembly Hall (Flammable Storage Cabinet Top Surface)	110
VTLYN281-4	Assembly Hall (Fire Alarm Control Box)	830
VTLYN281-5	Assembly Hall (Table Top Surface)	43
VTLYN281-6	Field Blank	0.39

[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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with sample results greater than 200 µg/ft^2.

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Lyndonville, Vermont
Date of Sampling: 29 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTLYN209-A1	SSG [redacted]	1131-1246/75	2.489	186.67	<0.005
VTLYN209-A2	General Sample-Converted Firing Range	1215-1330/75	2.494	187.06	<0.005
VTLYN209-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 available 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
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Lyndonville, Vermont
Date of Sampling: 29 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor- Copy room	1	526	53.0	77.4
2nd Floor	1	472	49.3	76.5
Outdoors	-	432	52.4	78.6

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.

Table 4
Illumination Readings
National Guard Armory
Lyndonville, Vermont
Date of Sampling: 29 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
COB DET FSB RNCO Office	28.2-68.1	70	No
Women's Latrine	15.8-55.1	40	Some Areas
Men's Latrine	33.6-70.1	40	Some Areas
Recruiting Office	19.1-87.3	70	Some Areas
Front Middle Office	34.7-93.5	70	Some Areas
Classroom	45.3-82.7	70	Some Areas
2nd Floor Office	48.1-92.1	70	Some Areas
Kitchen (Storage)	14.1-60.3	30	Some Areas
Supply Room Office Area	25.1-63.5	70	No
Kitchen	38.2-65.3	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 5

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Lyndonville, Vermont

Date of Sampling: 29 July 2003

Sample Number	Location	Results, µg/ft^2 [a]
VTLYN209-7	Floor Outside the Range	790
VTLYN209-8	Bullet Trap Floor	17000
VTLYN209-9	Light Fixture	3800
VTLYN209-10	Floor	1000
VTLYN209-11	Stored Item - Locker Top	1000
VTLYN209-12	Field Blank	<12 µg
VTLYN209-13	Inside Remaining Ventilation Ductwork	6400
VTLYN209-14	Storage Room (Separate Room)	1300

[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.

Appendix A
HHIM Data Form(s)

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.
	Lyndonville Armory Vermont ARNG	Lyndonville

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative OP / ADO
SURVEY DATE	**EVALUATOR (Initials)**
29 July 2003	M.S.

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802 626 5503	Company D (1st PLN 172nd Armor / 86th BDE) 92d IUE	5	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
1	6	0	0	0

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
ACID		
COLD SURFACES		
HOT SURFACES		
NBC AGENTS		
OIL		
SOLVENTS		
SURGICAL GLOVES		

RESPIRATOR	MOSHTIC NO.	MANUFACTURER	R	U
AIRLINE				
ABRASIVE BLASTING HOOD				
DISPOSABLE				
FULL FACE AIR PURIFYING				
1/2 FACE AIR PURIFYING				
POWERED AIR PURIFYING				
1/4 FACE AIR PURIFYING				
SELF CONTAINED				

EYES/FACE	R	U

HEARING	R	U
CANAL CAPS		
EAR PLUGS		
HELMETS		
MUFFS		
MUFF/EARPLUG COMBO		
MUFF/EARPLUG W/TIME LIMIT		

BODY	R	U
APRONS		
COLD WEATHER CLOTHING		
COVERALLS		
FULL BODY SUIT		
HEAT REFLECTIVE VEST/SUIT		
SAFETY BELT/HARNESS		

HEAD/FIT	R
COLD WEATHER BOOTS/HATS	
HARD HATS	
IMPERMEABLE BOOTS	
SAFETY/CONDUCTIVE SHOES	
SAFETY/NON-CONDUCTIVE SHOES	

AEHA Form 271-R (Test), 1 Jan 92 (HSHB-MI-I)

Lyndonville

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTXXXX	Video Display Terminal	3- low	D Uncontrolled Physical
332-21-4	Asbestos (Other)	2= moderate	C Uncontrolled Respiratory
7439-92-	Lead inorganic dusts & fumes	2= moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	
Non-Responsive [redacted]		A	m	Non-Responsive [redacted]	MIL
		N	↓	↓	↓
		M	↓	↓	↓
			↓	↓	↓
		K	↓	↓	↓
			↓	↓	CIU
		M	↓	↓	MIL

SECTION 6. COMMENTS

No comments See attached sheet

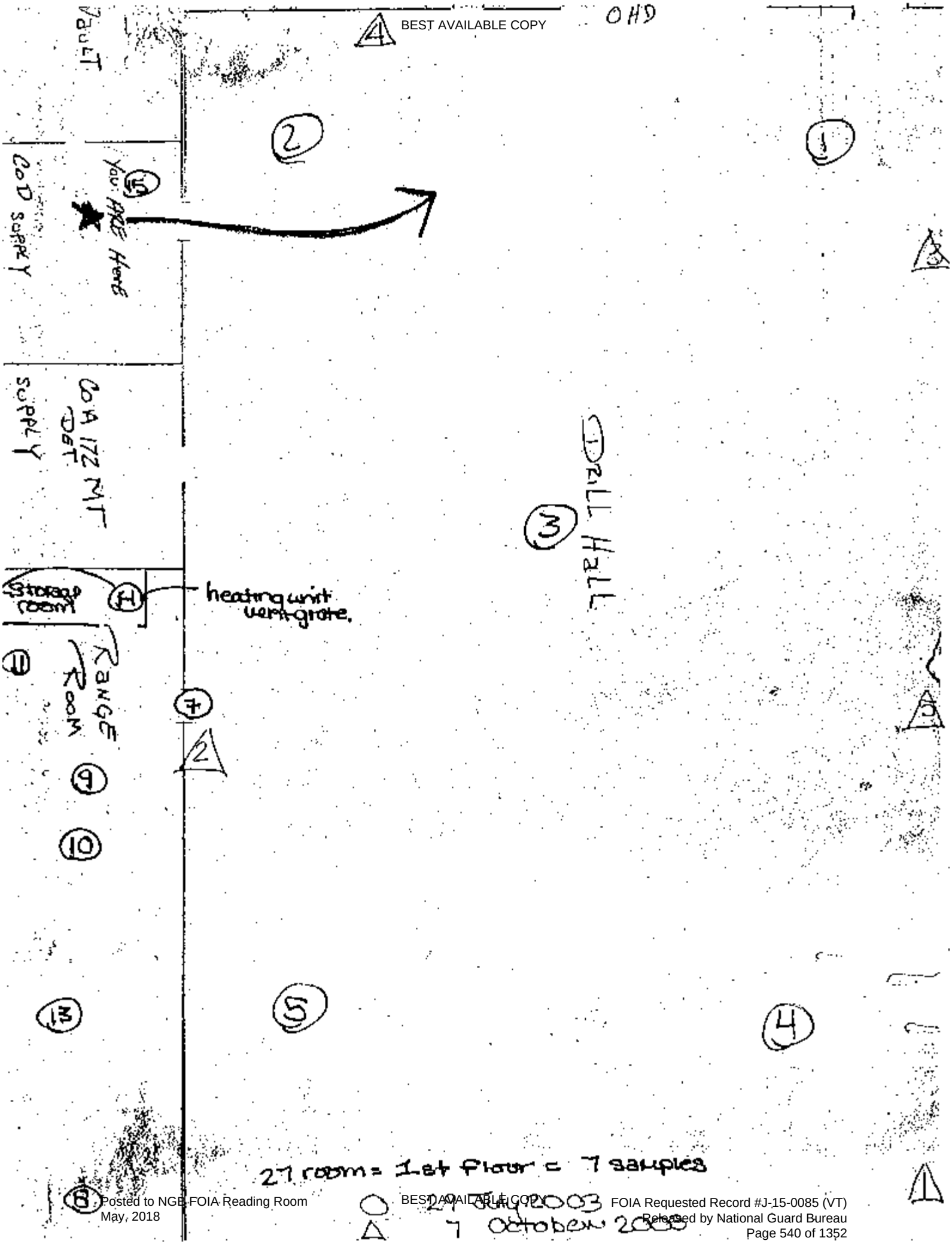
Survey conducted by Rochele Seman. Building contains 5 full time military staff members, 1 part time (3+ days/week) and 1 custodian (part time 2 days per week). The full time staff performs mainly administrative functions.

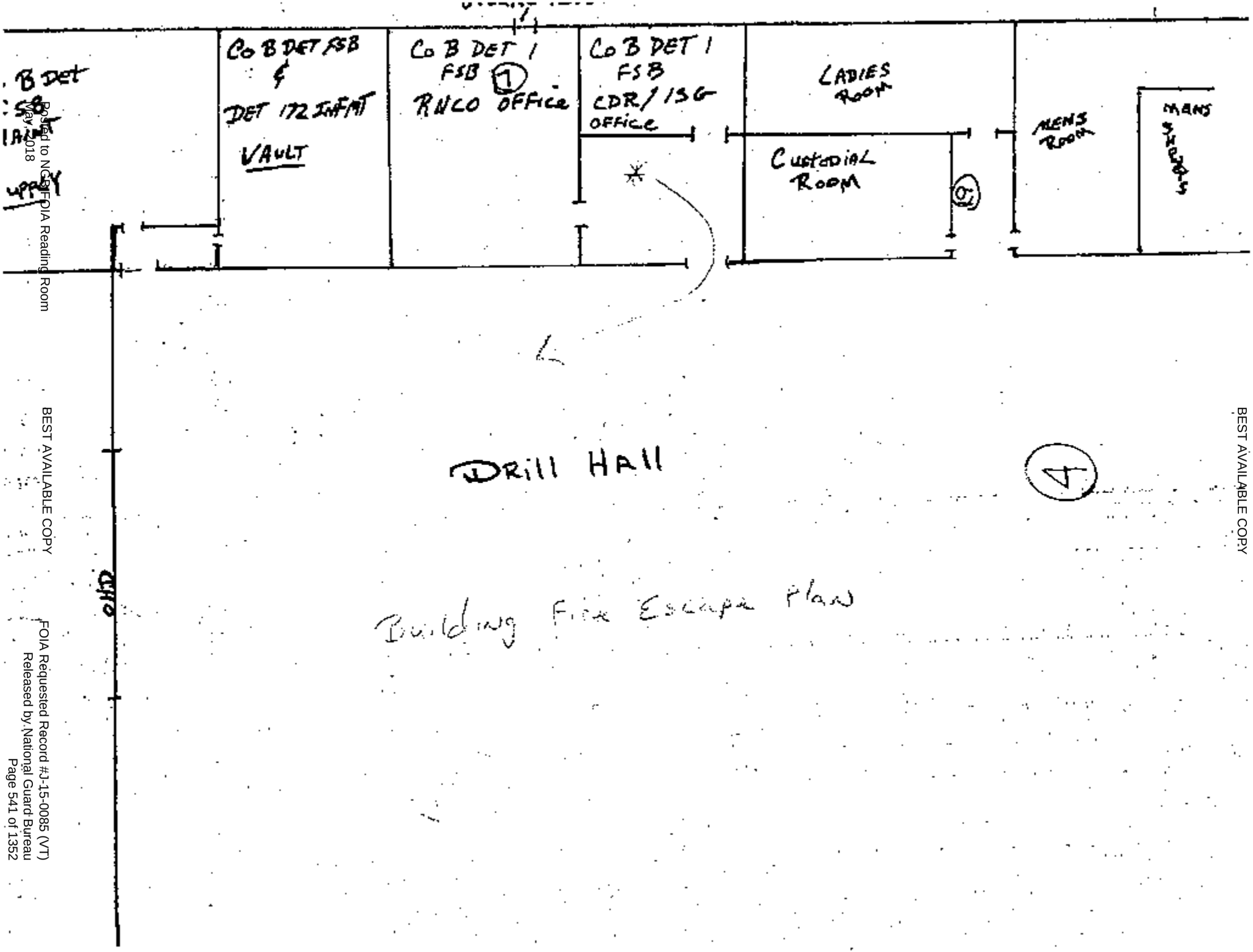
PRIVACY ACT STATEMENT

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.

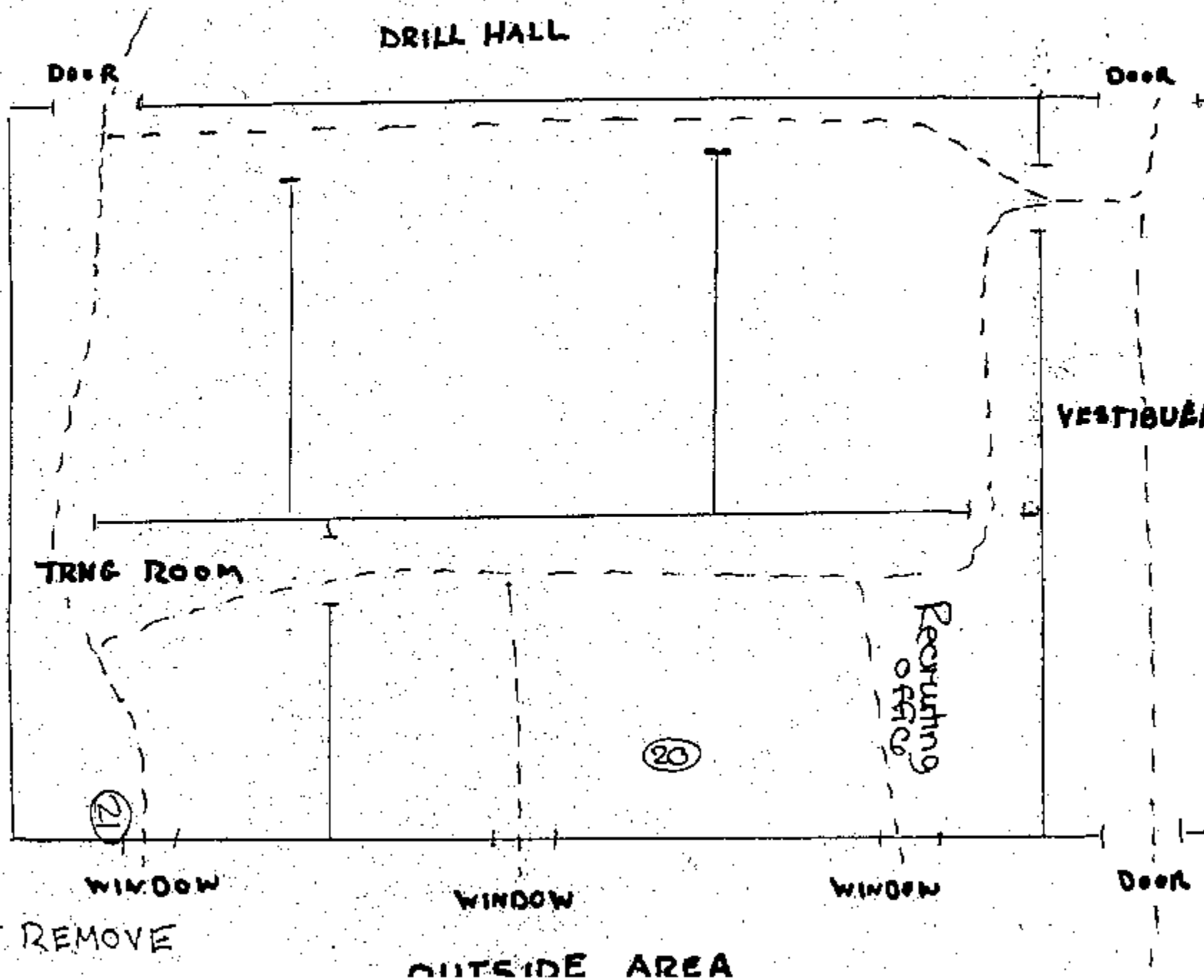
Disclosure of your Social Security Number is not mandatory; however, nondisclosures may result in untimely provision of proper medical monitoring.

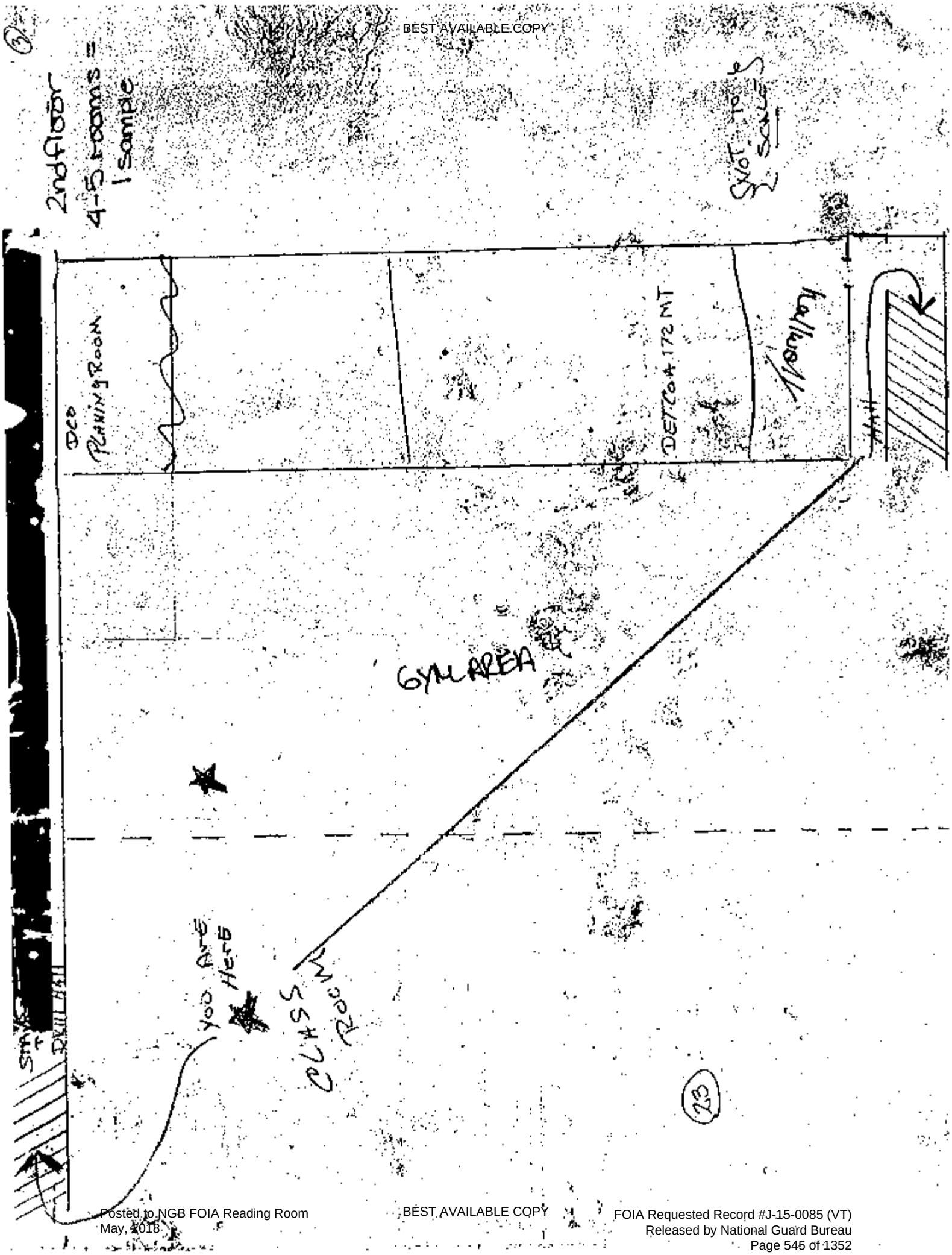
Appendix B
Building Layout





FIRE PLAN-OFFICE AREA





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:**	VTLYN209	**Chain Of Custody:**	116193
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/08/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	08-Aug-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
0361038	VTLYN209-1	Flame	Wipe	****	0.111	108.01	ug/ft²	< 110	ug/ft²	
0361039	VTLYN209-2	Flame	Wipe	****	0.111	108.01	ug/ft²	< 110	ug/ft²	
0361040	VTLYN209-3	Flame	Wipe	****	0.111	108.01	ug/ft²	< 110	ug/ft²	
0361041	VTLYN209-4	Flame	Wipe	****	0.111	108.01	ug/ft²	< 110	ug/ft²	
0361042	VTLYN209-5	Flame	Wipe	****	0.111	108.01	ug/ft²	130	ug/ft²	
0361043	VTLYN209-6	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0361044	VTLYN209-7	Flame	Wipe	****	0.111	108.01	ug/ft²	790	ug/ft²	
0361045	VTLYN209-8	Flame	Wipe	****	0.111	108.01	ug/ft²	17000	ug/ft²	
0361046	VTLYN209-9	Flame	Wipe	****	0.111	108.01	ug/ft²	3800	ug/ft²	
0361047	VTLYN209-10	Flame	Wipe	****	0.111	108.01	ug/ft²	1000	ug/ft²	
0361048	VTLYN209-11	Flame	Wipe	****	0.111	108.01	ug/ft²	1000	ug/ft²	
0361049	VTLYN209-12	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0361050	VTLYN209-13	Flame	Wipe	****	0.111	108.01	ug/ft²	6400	ug/ft²	
0361051	VTLYN209-14	Flame	Wipe	****	0.111	108.01	ug/ft²	1300	ug/ft²	

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CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTLYN209	**Chain Of Custody:**	118890
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/27/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	27-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 (ft^2)	Reporting Limit		Final Result		Comments
0404046	VTLYN209-15	Furnace	Wipe	****	0.111	2.70	ug/ft^2	14	ug/ft^2	
0404047	VTLYN209-16	Furnace	Wipe	****	0.111	2.70	ug/ft^2	5.4	ug/ft^2	
0404048	VTLYN209-17	Furnace	Wipe	****	0.111	2.70	ug/ft^2	23	ug/ft^2	
0404049	VTLYN209-18	Furnace	Wipe Blank	****	N/A	0.30	ug	0.3	ug	
0404050	VTLYN209-19	Furnace	Wipe	****	0.111	67.51	ug/ft^2	130	ug/ft^2	
0404051	VTLYN209-20	Furnace	Wipe	****	0.111	2.70	ug/ft^2	< 2.7	ug/ft^2	
0404052	VTLYN209-21	Furnace	Wipe	****	0.111	67.51	ug/ft^2	120	ug/ft^2	
0404053	VTLYN209-22	Furnace	Wipe	****	0.111	2.70	ug/ft^2	6.5	ug/ft^2	
0404054	VTLYN209-23	Furnace	Wipe	****	0.111	2.70	ug/ft^2	7.9	ug/ft^2	
0404055	VTLYN209-24	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]

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CERTIFICATE OF ANALYSIS

NVLAP
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AIHA

Client:	National Guard Bureau	**Job Name:**	VTLYN281	**Chain Of Custody:**	118705
Address:	301-IH Old Bay Lanc, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/16/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	16-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
0402838	VTLYN281 -1	Furnace	Wipe	****	0.111	27.00	ug/ft²	90	ug/ft²	
0402839	VTLYN281 -2	Furnace	Wipe	****	0.111	13.50	ug/ft²	78	ug/ft²	
0402840	VTLYN281 -3	Furnace	Wipe	****	0.111	27.00	ug/ft²	110	ug/ft²	
0402841	VTLYN281 -4	Furnace	Wipe	****	0.111	135.01	ug/ft²	830	ug/ft²	
0402842	VTLYN281 -5	Furnace	Wipe	****	0.111	13.50	ug/ft²	43	ug/ft²	
0402843	VTLYN281 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.39	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]

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AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP NY ELAP AIHA

Client:	National Guard Bureau	**Job Name:**	VTLYN209	**Chain Of Custody:**	116193
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation Havre de Grace, Maryland 21078	**Job Location:**	Not Provided	**Date Analyzed:**	08/08/2003
		Job Number:	Not Provided	**Person Submitting:**	[redacted]
Attention:	[redacted]	**P.O. Number:**	07-01	**Report Date:**	08-Aug-03

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

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
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DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTRED210-A2 through VTWIN210-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3799
DCL Sample ID No.:	03-23284 through 03-23312
Sample Receipt Date:	8/4/2003
Preparation Date:	08/07/03
Analysis Date:	08/07/03

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/m^3
VTRED210-A2	03-23284	0	ND	-
VTNEW209-A1	03-23285	210.24	ND	<0.005
VTNEW209-A2	03-23286	0	ND	-
VTBRA209-A1	03-23288	197.36	ND	<0.005
VTBRA209-A2	03-23289	0	ND	-
VTLYN209-A1	03-23290	186.67	ND	<0.005
VTLYN209-A2	03-23291	187.06	ND	<0.005
VTLYN209-A3	03-23292	0	ND	-
VTNOR213-A1	03-23293	376.81	ND	<0.003
VTNOR213-A2	03-23294	0	ND	-
VTLUD212-A1	03-23297	157.79	ND	<0.006
VTLUD212-A2	03-23298	275.40	ND	<0.004
VTLUD212-A3	03-23299	0	ND	-
VTWIN212-A1	03-23305	173.64	ND	<0.006
VTWIN212-A2	03-23306	0	ND	-
VTVER210-A1	03-23307	259.68	ND	<0.004
VTVER210-A2	03-23308	0	ND	-
VTRED210-A1	03-23309	158.68	ND	<0.006
VTWIN210-A1	03-23310	218.92	ND	<0.005
VTWIN210-A2	03-23311	193.56	ND	<0.005
VTWIN210-A3	03-23312	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		99.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** LYN
Date: 7/29/2002

Sample 1

Sample Number: VTLYN209-A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.509	2.478
	2.502	2.479
	2.497	2.477
	2.497	2.472
Average	**2.501**	**2.477**

Average Pre and Post **2.4889**

Time 1 11:31
Time 2 12:46
Total Time Sampled **1:15**
Minutes Sampled 75.00

Volume **186.67 Liters**

Sample 2

Sample Number: VTLYN209-A2
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.533	2.468
	2.524	2.476
	2.516	2.458
	2.506	2.472
Average	**2.520**	**2.469**

Average Pre and Post **2.4941**

Time 1 12:15
Time 2 13:30
Total Time Sampled **1:15**
Minutes Sampled 75.00

Volume **187.06 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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Lyndonville Readiness Center
73 High Street
Lyndonville, VT 05851

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 26, 2011

AEI Project #: J11-601 4L VT Lyndonville RC

_____

Non-[redacted], **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Lyndonville Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Lyndonville Readiness Center located at 73 High Street, Lyndonville, VT 05851. Non-[redacted], CIH, CSP performed the evaluation on October 26, 2011. The point of contact for the facility was SFC Non-[redacted]. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the Boiler Room. A bulk sample of the peeling paint contained 0.19% lead by weight which is less than the EPA and State of Vermont definitions of lead-based paint (0.5% by weight). Results of dust wipe samples collected throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for a sample collected on the heater in the former firing range (<340 µg/ft^2). No lead was detected in this sample, but the limit of detection was above the recommended maximum due to insufficient sample size. Lead was not detected in any of the samples collected in the former firing range.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged suspect floor tile and mastic were observed and sampled from the doorway to the Administration Office. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The submitted floor tile and mastic samples contained 2% and 5% Chrysotile asbestos, respectively. The broken floor tile also creates a possible tripping hazard.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Water stains were observed on the ceiling in the kitchen area and on ceiling tiles in several areas throughout the building. These stains are most likely old because the roof was replaced within the past year. No pooling of water, wet areas or mold was observed.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement especially in the janitor's closet and the kitchen. The building was being renovated which may have contributed to storage and housekeeping problems.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the janitor's closet and the gym. The illumination measurements indoors ranged from 5 foot candles (fc) to 1,000 fc.

Indoor Air Quality: Temperature and relative humidity measurements were within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 51.0° F and 37.4% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and MSDSs for some new custodial products were required per OSHA 29 CFR 1910.1200.

Overall, the Lyndonville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Lyndonville Readiness Center located at 73 High Street, Lyndonville, VT 05851. Non- , CIH, CSP performed the evaluation on October 26, 2011. The point of contact for the facility was SFC Non- . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Lyndonville Readiness Center was built in the 1950s and was being renovated at the time of the survey. The readiness center is staffed by 5 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Lyndonville Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Lyndonville facility consist exclusively of supply and administrative duties. Some vehicle stenciling is performed. No other maintenance of vehicles or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the Boiler Room and a bulk sample was sent to AMA Analytical Services, Inc. (AMA) of Lanham, MD for lead analysis. The sample contained 0.19% lead by weight which would not be considered lead-based by the Environmental Protection Agency (EPA) and the State of Vermont definitions (0.5% by weight). Certificates of analysis are included in Appendix B.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from a heater in the former firing range (<340 µg/ft^2). No lead was detected in this sample, but the limit of detection was above the recommended maximum due to insufficient sample size. Lead was not detected in any of the other samples collected in the former firing range. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Lyndonville Readiness Center on October 26, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
LYN – 01	Drill Hall – floor	<110
LYN – 02	Drill Hall – electrical box	<110
LYN – 03	Drill Hall – floor	<110
LYN – 04	Drill Hall – vent	<120
LYN – 05	Drill Hall – floor	<110
LYN – 06	Former Firing Range – floor	<110

Table 1 – Results of Dust Wipe Sampling for VT ARNG Lyndonville Readiness Center on October 26, 2011.

Wipe Sample #	Sample Location	Result (µg/ft²)*
LYN – 07	Former Firing Range – treadmill	<110
LYN – 08	Former Firing Range – table	<110
LYN – 09	Former Firing Range – heater	**<340**
LYN – 10	Former Firing Range – floor	<110
LYN – 11	Kitchen – serving counter	<110
LYN – 12	Supply Office – floor	<110
LYN - 13	2nd Floor Classroom – floor	<110

*The recommended maximum level for adult exposures is 200 µg/ft² lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged suspect floor tile and mastic were observed and sampled from the doorway to the Administration Office. The sample was submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM) using EPA method 600/R-93/116. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The submitted floor tile and mastic samples contained 2% and 5% Chrysotile asbestos, respectively. Certificates of analysis are included in Appendix B. The broken floor tile also creates a possible tripping hazard.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Water stains were observed on the ceiling in the kitchen area and on ceiling tiles in several areas throughout the building. These stains are most likely old because the roof was replaced within the past year. No pooling of water, wet areas or mold was observed.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement especially in the janitor's closet and the kitchen. The building was being renovated which may have contributed to storage and housekeeping problems.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on March 9, 2011, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas: the janitor's closet and the gym. The

illumination measurements indoors ranged from 5 foot candles (fc) to 1,000 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in February, 2011. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 69.0 to 73.9° F and 35.5 to 39.9% Rh. Temperatures and relative humidity were all within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 51.0° F and 37.4% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 571 to 788 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 0.7 ppm; therefore, concentrations

are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updating of the MSDS notebook was necessary as per OSHA 29 CFR 1910.1200 requirements.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling lead-based paints, noise hazards and visible mold. The results of the evaluation indicated industrial hygiene concerns in the following areas: lighting, damaged asbestos-containing floor tile and mastic, and some hazard communication issues. Overall, the Lyndonville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.

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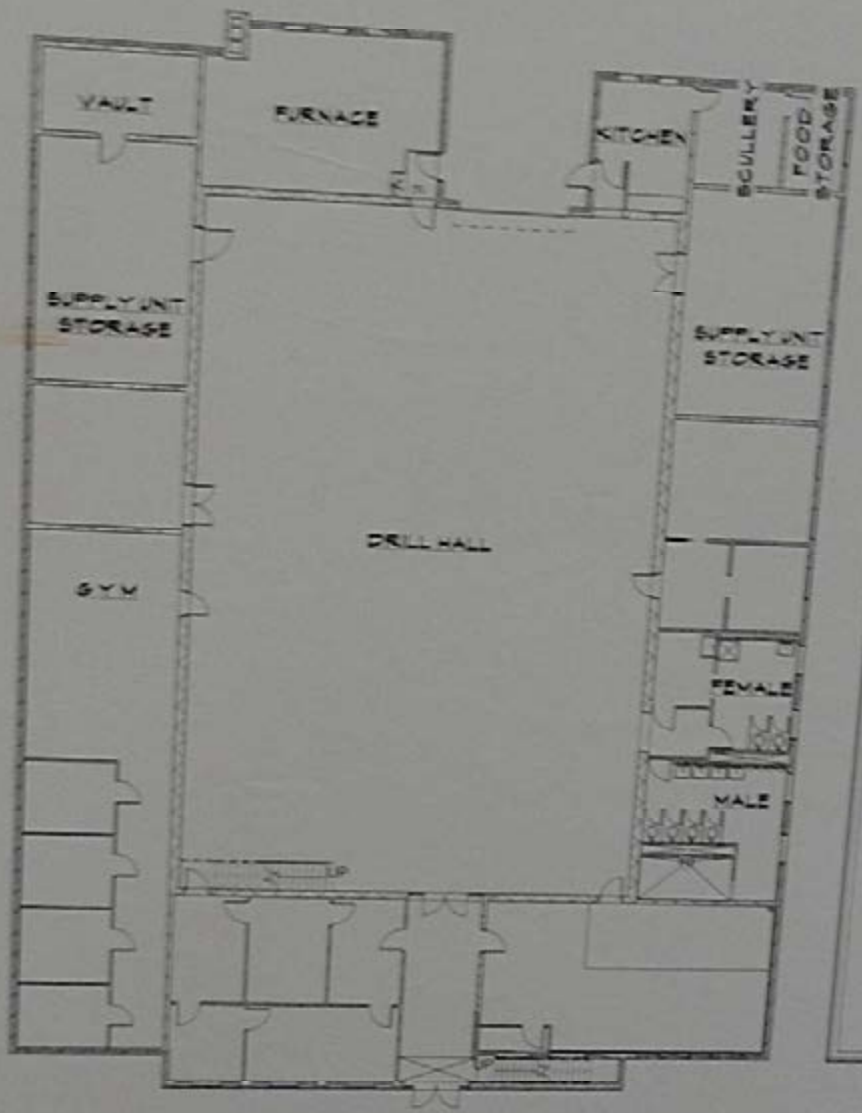
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 10 October 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 28 March 2009.
8. Army Regulation (AR) 420-1 Army Facilities Management, 28 March 2009.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout

LYNDONVILLE ARMORY

VERMONT ARMY NATIONAL GUARD



1 MAIN FLOOR PLAN -- EXISTING CONDITIONS
1/16" = 1'-0"

2 2nd FLOOR PLAN -
1/16" = 1'-0"

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Lyndonville RC	**Chain Of Custody:**	511731		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Lyndonville, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011
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
12010595	Lyn-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010596	Lyn-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010597	Lyn-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010598	Lyn-04	Flame	Wipe	****	0.104	120	ug/ft²	<12	<120	ug/ft²	
12010599	Lyn-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010600	Lyn-06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010601	Lyn-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010602	Lyn-08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010603	Lyn-09	Flame	Wipe	****	0.035	340	ug/ft²	<12	<340	ug/ft²	
12010604	Lyn-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010605	Lyn-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010606	Lyn-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010607	Lyn-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010610	Lyn-Blk-02	Flame	Paint Chip	****	N/A	0.0075	%Pb		0.19	%Pb	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Lyndonville RC	**Chain Of Custody:**	511731
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Lyndonville, VT	**Date Submitted:**	11/1/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsiv
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011

Report Date: 11/8/2011

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.

Analyst Non-Responsive

Technical Manager Non-Responsive

OWL (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) 511731

p. 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: Lyndonville RC
2. Job Location: Lyndonville, VT
3. Job #: JH-1601 P.O. #: W912K8-09-A-0003
4. Contact Person: Non-Responsive
5. Submitted by: Non-Responsive Signature: 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 ☒ 2 Day + Date Due: W/8/11
☐ 2 Day
☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ Include with Report
☒ Email: Non-Responsive @aria enviro.com
☐ Fax: @us.army.mil
☐ 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) NOW

PLM Bulk
☐ EPA 600 – Visual Estimate 12 (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 (Qual) PLM/TEM (Qual)

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 10X10) 12 (QTY) (13 total)
☐ 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)

Cm 2

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WIPE AND SWITCH	SPORE TRAP	TAPE	SWAB
Lyn – 01		10/26		100				X								
02				100												
03				100												
04				96.80												
05				100												
06				100												
07				100												
08				100												
09				32.3												
10				100												
11				100												
12				100				√								

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: 11/1/11 @ 1015 Via: Fedex By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments: 7952 7173 28

OWL (410) 247-2024

159202

210 REV. 6.08

COC# 51173

P. 2/2

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)

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: Lyndonville RC
2. Job Location: Lyndonville, VT
3. Job #: 111-608 P.O. #: W912K8-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted] Signature: [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 +
- ☐ 2 Day Date Due:
- ☐ Results Required By Noon (EverytAttempt Will Be Made to Accomodate)

REPORT TO:
- ☐ Include COC/Field Data Sheets with Report
- ☐ Email: [redacted] @aiaenviro.com
- ☐ Fax: @us.army.mil
- ☐ 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 (QTY)
- ☒ Pb Dust Wipe (wipe-type) 1 (QTY) (13 total)
- ☐ 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 LIQUIDS	SPORE TRAP	TAPE	SWAB
Lyn-13		10/26		10x10				X								
Lyn-WK-01	Fitmaster	↓					X									
Lyn-WK-02	Child	✓						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: / /
4. Comments:

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Lyndonville RC	**Chain Of Custody:**	511731
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Lyndonville, VT	**Date Analyzed:**	11/8/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsiv
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12010608	Lyn-Blk-01 FT	2	2	--	--	--	--	--	--	--	--	98	FT	Beige	Homogeneous	PC	
12010609	Lyn-Blk-01 M	5	5	--	--	--	--	--	--	--	--	95	MS	Black	Homogeneous	PC	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

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

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

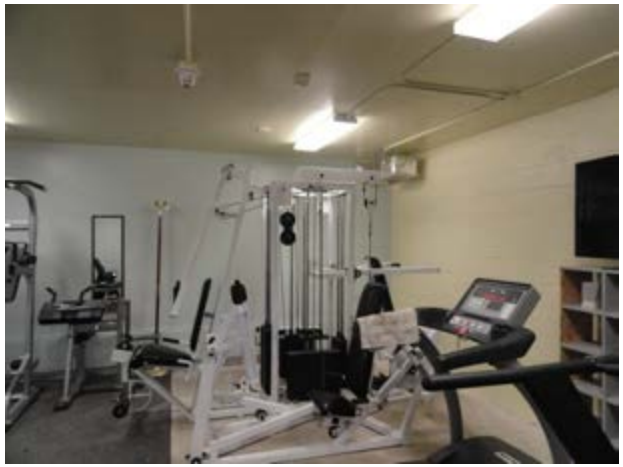
Appendix C
Photo Documentation

Lyndonville, VT Readiness Center

Lyndonville RC Exterior

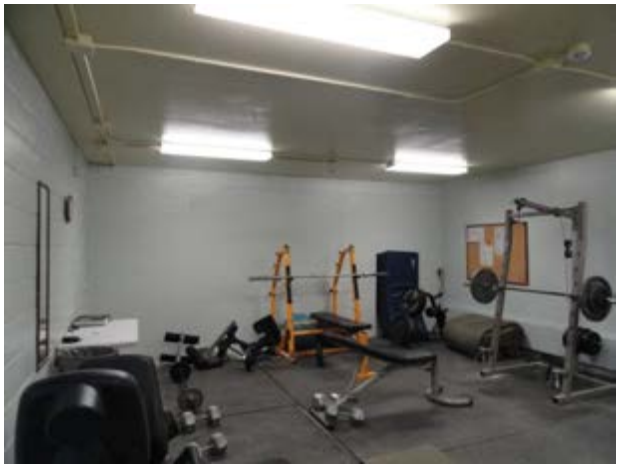
Drill Hall

View of Fitness Center from Drill Hall



Fitness Center

Lyndonville, VT Readiness Center



Fitness Center 2

Storage Room

Drill Hall 2

Bunk Room

Lyndonville, VT Readiness Center

Locker Room

Janitor's Closet

Janitor's Closet Storage Cabinet

Janitor's Closet Storage Shelf

Lyndonville, VT Readiness Center

MSDSs in Janitor's Closet

Remodeled Bathroom

Offices

Kitchen

Lyndonville, VT Readiness Center

Kitchen 2

Kitchen 3

Water Damage on Ceiling

Water Damage on Ceiling

Lyndonville, VT Readiness Center

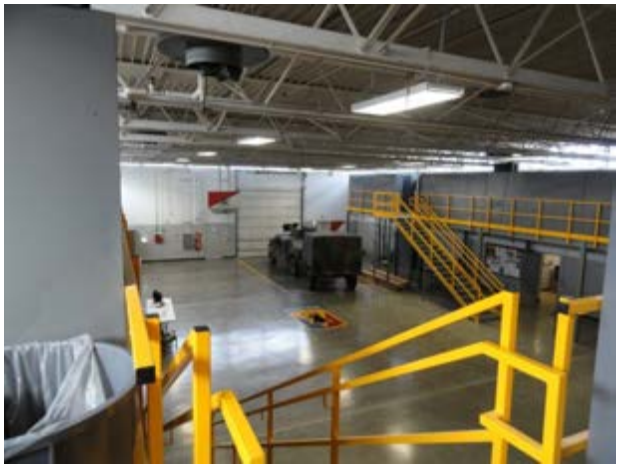
Flammable Storage Cabinet

Flammable Storage Cabinet 2

Supply Room

Lyndonville, VT Readiness Center

2nd Floor Classroom Area



View from Second Floor

Damaged Floor Tile

Office

Lyndonville, VT Readiness Center

Boiler Room

Boiler Room – water incursion

Boiler Room

Vent in Drill Hall

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Lyndonville	IAQ							Light		
Date	10/26/2011	Inspector	Non-	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	Lyndonville RC			Serial Number		7565X0839020					Serial Number		K070003
Weather Conditions	Cool, Clear			Last Calibration		Feb-11					Last Calibration		9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		1	10:52	70.7		37.1		571		0.3		50-102		30-50
Bunk Room		1	10:55	69.0		38.6		576		0.1		14-52		5
Women's Bathroom		1	10:55	71.5		36.0		700		0.1		80-100		5
JC		1	10:56									5-8	X	30
Office 4B		1	10:56									55		30-50
R&R Office		2	11:00	73.9		38.4		788		0.4		30-80		30-50
Kitchen		1	10:58	72.8		35.5		619		0.4		60-94		50
Food Storage		1	10:58	73.0		35.8		614		0.4		70-85		30
Kit Storage		1	10:59	73.5		35.9		638		0.5		65-70		30
Supply Room		3	11:01	73.1		36.8		617		0.4		40-80		30
Drill Hall Storage		1	11:02									45-50		30
Gym		1	11:03	73.4		36.5		615		0.7		18-80	X	30
Storage Room		1	11:08	70.7		37.2		614		0.7		30-67		30
Admin Office		2	11:09	70.9		38.6		632		0.4		40-70		30-50
Admin Readiness Office		2	11:10	72.3		38.1		783		0.6		60-155		30-50
NCO Office		1	11:10	73.4		37.3		683		0.3		50-300		30-50
Center office		1	11:13									50-90		30-50
Copier Area		1	11:13									40-95		30-50
Second Floor Computer Room		1	11:50	71.8		39.7		717		0.4		40-103		30-50
Command Office		3	11:52	70.9		39.9		721		0.6		40-100		30-50
Mezzanine Area		1	11:53									80-1,000		30
Outside			12:16	51.0		37.4		413		1.3				

Industrial Hygiene Survey

Vermont Army National Guard (VTARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Lyndonville Readiness Center
73 High Street
Lyndonville, VT 05851

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 24, 2012

AEI Project #: J12-686 3m VT Lyndonville RC

_____

Non-[redacted], **CIH, CSP**
Industrial Hygienist

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Lyndonville Readiness Center

Table of Contents

List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Lyndonville Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Lyndonville Readiness Center located at 73 High Street, Lyndonville, VT 05851. Non-[redacted], CIH, CSP performed the evaluation on October 24, 2012. The point of contact for the facility was SSG Non-[redacted]. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the Boiler Room. A bulk sample of the peeling paint contained 0.19% lead by weight which is less than the EPA and State of Vermont definitions of lead-based paint (0.5% by weight). Results of dust wipe samples collected throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for a sample collected on the heater in the former firing range (<340 µg/ft^2). No lead was detected in this sample, but the limit of detection was above the recommended maximum due to insufficient sample size. Lead was not detected in any of the samples collected in the former firing range.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect material was observed that was not addressed in the 2011 survey.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Water stains were observed on the ceiling in the kitchen area and on ceiling tiles in several areas throughout the building. These stains are most likely old because the roof was replaced within the last two years. Moisture fogged windows were observed on the 2nd floor. One area of the roof in the Drill Hall was being repaired due to leaks. No pooling of water, wet areas or mold was observed. Leaks should be repaired and damaged or leaky windows should be replaced when possible.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement to reduce accumulated dust, cobwebs and clutter.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the janitor's closet and the gym. The illumination measurements indoors ranged from 1 foot candles (fc) to 400 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 49.9° F and 45.0% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updating of the MSDS notebooks near flammable cabinets and in the janitor's closet was necessary as per OSHA 29 CFR 1910.1200 requirements. MSDSs for products no longer used should be "retired" and put in a separate section of the notebooks.

Overall, the Lyndonville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Lyndonville Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Lyndonville Readiness Center located at 73 High Street, Lyndonville, VT 05851. Non- , CIH, CSP performed the evaluation on October 24, 2012. The point of contact for the facility was SSG Non- . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Lyndonville Readiness Center was built in the 1950s and was renovated in 2011. The readiness center is staffed by 4 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Lyndonville Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Lyndonville facility consist exclusively of supply and administrative duties. Some vehicle stenciling is performed. No other maintenance of vehicles or other physical tasks are performed at the facility. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VTARNG Lyndonville Readiness Center on October 24, 2012.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
LYN – 01	Drill Hall – center of floor	<110
LYN – 02	Drill Hall – floor near bay door	<110
LYN – 03	Drill Hall – top of mobile food service island	<110
LYN – 04	Drill Hall – floor under basketball hoop	<110
LYN – 05	Drill Hall – floor near former range	<110
LYN – 06	Former Firing Range – Fintess center – front of treadmill	<110
LYN – 07	Former Firing Range – Classroom - floor covering bullet trap area	<110
LYN – 08	Kitchen – top of microwave	<110
LYN – 09	Mezzanine storage – floor	<110
LYN – 10	2nd Floor Classroom – painted window sill	<110
LYN – 11	2nd Floor Classroom – floor	<110

Table 1 – Results of Dust Wipe Sampling for VTARNG Lyndonville Readiness Center on October 24, 2012.

Wipe Sample #	Sample Location	Result (µg/ft²)*
LYN – 12	Kitchen – metal window sill	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect material was observed that was not addressed in the 2011 survey.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Water stains were observed on the ceiling in the kitchen area and on ceiling tiles in several areas throughout the building. These stains are most likely old because the roof was replaced within the last two years. Moisture fogged windows were observed on the 2nd floor. One area of the roof in the Drill Hall was being repaired due to leaks. No pooling of water, wet areas or mold was observed.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement due to dust accumulation, cobwebs and clutter.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. The illumination measurements indoors ranged from 1 foot candles (fc) to 400 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7656X, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30

and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 69.0 to 73.3° F and 22.9 to 38.7% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 49.9° F and 45.0% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 505 to 718 parts per million (ppm), and the outdoor measurement was 373 ppm. CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 3.0 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updating of the MSDS notebooks near flammable cabinets and in the janitor's closet was necessary as per OSHA 29 CFR 1910.1200 requirements. MSDSs for products no longer used should be "retired" and put in a separate section of the notebooks.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the Lyndonville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

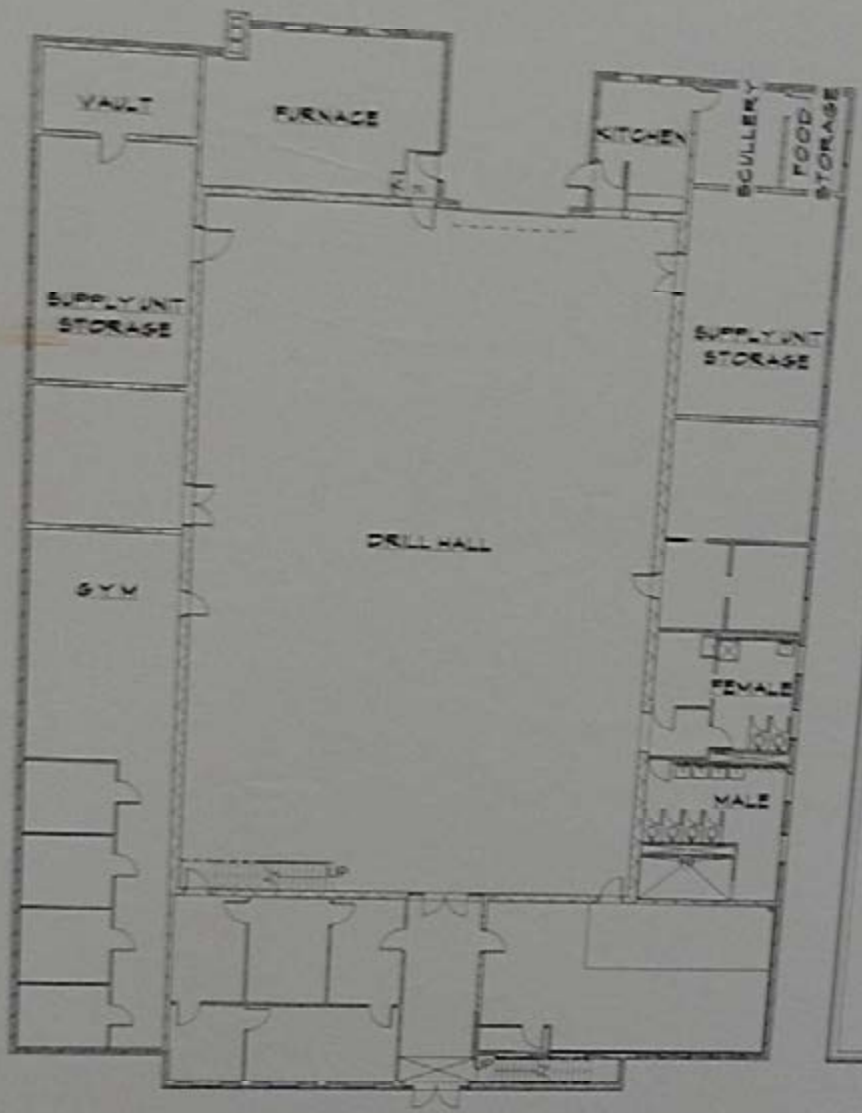
1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.

12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout

LYNDONVILLE ARMORY

VERMONT ARMY NATIONAL GUARD



1 MAIN FLOOR PLAN -- EXISTING CONDITIONS
1/16" = 1'-0"

2 2nd FLOOR PLAN -
1/16" = 1'-0"

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	Lyndonville RC	**Chain Of Custody:**	514360
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Lyndonville, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsi
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/8/2012
Attention:	Non-Responsive			**Report Date:**	11/9/2012

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
13010493	LYN-W 01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010494	LYN-W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010495	LYN-W 03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010496	LYN-W 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010497	LYN-W 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010498	LYN-W 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010499	LYN-W 07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010500	LYN-W 08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010501	LYN-W 09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010502	LYN-W 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010503	LYN-W 11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010504	LYN-W 12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

AMA Analytical Services, Inc.

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Client:	National Guard Bureau	**Job Name:**	Lyndonville RC	**Chain Of Custody:**	514360
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Lyndonville, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsi
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/8/2012

Report Date: 11/9/2012

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.

Analyst: Non-Responsive

Technical Manag 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) 514360

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: Lyndonville RC
2. Job Location: Lyndonville, VT
3. Job #: J12-685 P.O. #: W912K6-09-A-0003
4. Contact Person [redacted] @ Phone #: [redacted]
5. Submitted by: [redacted] Signature: [redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day turnaround to contacts on file.

AFTER 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] ariaenviro.com
Comments:	❑ 2 Day Date Due: 11/9/12	❑ Fax: [redacted] us.army.mil
	❑ Results Required By Noon	❑ Verbal [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)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ❑ Pb Paint Chip ____ (QTY)
- ☒ *Pb Dust Wipe (wipe type 10x10 cm) 12 (QTY) ghost
- ❑ *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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	SEE ATTACHED FIELD DATA SHEETS														

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: 11/2/12 @ Via: Fed Ex By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: ____/____/____ @ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____/____/____ Time: ____ Initials: ____
4. Comments: 781 272 092

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10-24-12

Job Site: Lyndonville RC

Project No.: J12-1085

Inspector: Non-Responsive

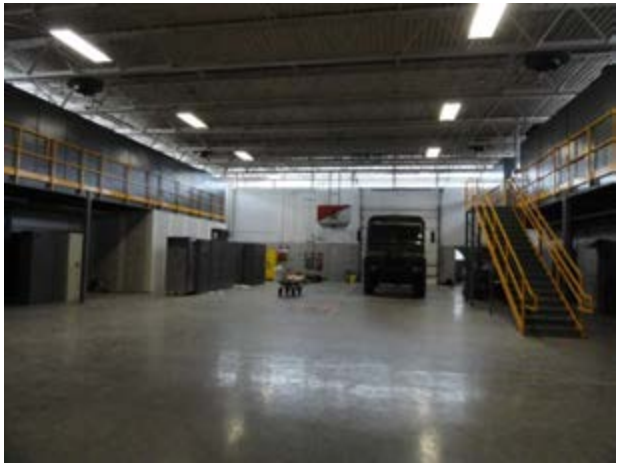
10 x 10 cm

Sample No.	Sample Type	Sample Location	Dimensions (Area)
Lyn-W01		Dill Hall – center of floor	
W02		Dill Hall – floor near bay door	
W03		Dill Hall – top of food service (movable) island	
W04		Dill Hall – floor under basketball hoop	
W05		Dill Hall – floor near entry to former range	
W06	FIFR	Fitness Ctr – dusty front of treadmill	
W07	RC	CR + Storage Room – wooden floor (painted) covering bullet trap pit	
W08		Kitchen – top of microwave (dusty)	
W09		Mezzanine Storage – top of stairs (wood) floor @	
W10		2nd Fl CR – painted window sill (wood)	
W11		2nd Fl CR – VCT floor	
W12		Kitchen – metal window sill	

Appendix C
Photo Documentation

VT Lyndonville RC

Exterior



Drill Hall

Bunk Room

Electrical closet in bunk room

VT Lyndonville RC

Locker room

Janitor's closet

Chemicals in janitor's closet

Janitor's closet

VT Lyndonville RC

MSDSs in janitor's closet

Women's latrine

Scaffolding to fix a leak

Kitchen

VT Lyndonville RC

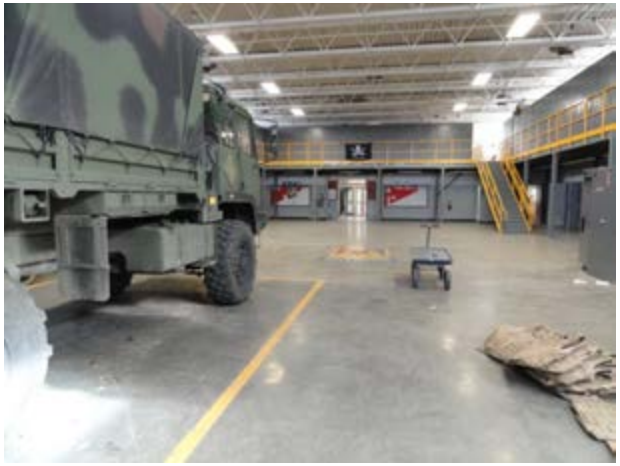
Kitchen

Kitchen storage

Stains on ceiling in Kitchen area

Broken floor tile in kitchen

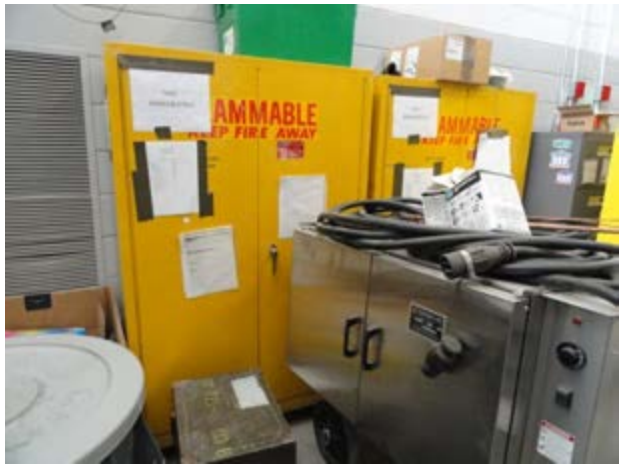
VT Lyndonville RC



Drill Hall

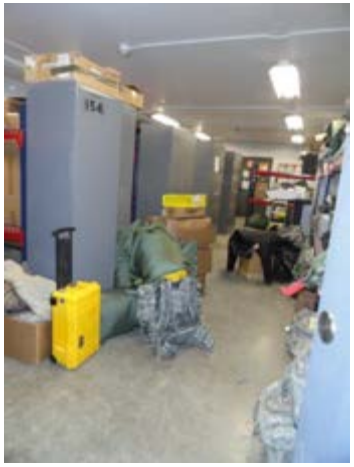
Drill Hall

Flammable cabinets with MSDSs



Flammable cabinets blocked by equipment

VT Lyndonville RC



Storage room

Fitness Center

Classroom

View of offices and classroom from Drill Hall

VT Lyndonville RC

Lobby

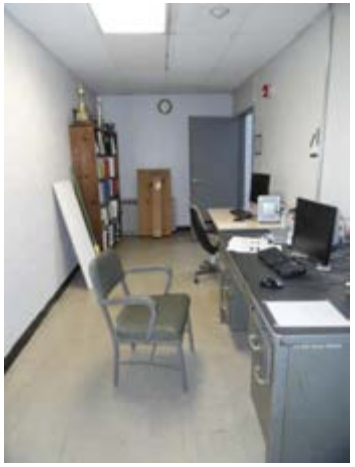
Offices

Mezzanine storage

View from mezzanine of Drill Hall

VT Lyndonville RC

2nd Floor Classroom



2nd Floor Office

2nd Floor Office

Fogged window

VT Lyndonville RC

Fogged window

Drill Hall

Boiler Room

Boiler Room

VT Lyndonville RC

Boiler Room

Building layout

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Lyndonville	IAQ							Light		
Date	10/24/2012	Inspector	Non-	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	Lyndonville RC			Serial Number		7565X0839019					Serial Number		K070003
Weather Conditions	Cool and Sunny			Last Calibration		Mar-12					Last Calibration		16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		2	1342	72.1		31.4		599		0.3		30-90	X	50
Foyer		1	1343									35-60		10
Bunk Room		1	1345	70.5		34.4		577		0.2		14-45		5
Locker Room		1	1346	69.6		35.5		543		0.3		5-32	X	7
Janitor's Closet		1	1347									7-10	X	30
Women's Latrine and Locker		1	1348	73.3		31.8		506		0.1		30-90		7
Fitness Center		1	1354	69.8		35.2		598		0.4		13-43	X	30
Classroom and Storage		1	1355	69.0		35.7		548		0.2		10-32	X	30-50
Admissions Office		2	1356	69.6		36.2		699		0.3		30-76		30-50
Storage Room		1	1357	70.4		30.3		652		0.3		30-86		30
Copier Room		1	1358	70.6		32.1		540		0.4		39-95		30
CO Office		1	1359	70.6		32.5		586		0.2		30-74		30-50
Office 4B		1	1401	71.3		35.2		698		0.3		20-62	X	30-50
R&R Office		5	1402	72.5		37.2		718		0.1		30-60		30-50
RNCO Office		3	1405	71.0		22.9	L	532		0.1		20-102	X	30-50
Food Storage		1	1406	69.6		30.1		505		0.2		50-75		10
Kitchen		1	1407	69.5		31.5		515		0.1		40-60	X	50
S4 Office		2	1410	70.0		36.8		547		3.0		30-60		30-50
Supply Room		2	1411	70.3		38.7		525		0.1		30-65		30-50
General Storage		2	1412									5-20	X	10
Mezzanine Storage Sunny Side		1	1417									60-400		30
Mezzanine Storage Shaded Side		1	1418	71.7		34.7		529		0.1		33-106		30
Classrooms A&B		1	1419	71.0		34.9		577		0.2		30-165		30-50
Computer Room		1	1420	70.9		35.6		574		0.2		18-109	X	30-50
2nd Floor Office		1	1421	70.5		36.1		587		0.2		55-102		30-50
Boiler Room		1	1520	70.7		26.6	L	633		0.2		1-25	X	30
Outside			1055	49.9		45.0		373		0.2				

Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Campbell Readiness Center – Montpelier, Vermont

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

19 February 2004

National Guard Armory
Campbell Readiness Center – Montpelier, Vermont

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

19 February 2004

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 Campbell Readiness Center in Montpelier, Vermont. Non-Responsive performed the evaluation on 24 July 2003 and 8 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 Exposure
- Lighting
- Converted Indoor Firing Range
- 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
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation

- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at three locations in the assembly/drill hall. It is recommended that these surfaces and the areas immediately around these surfaces 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall, 186 FSB OPS NCO Office, and the windowsill in the basement hallway. Areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.
- 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 the armory. The source of the water damage was likely from roof leaks or high water table and foundation leaks around the basement wall. The source of the water should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Visual mold was observed in the armory on the firing range room wall. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.
- Indoor air quality measurements revealed that the humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in most areas; therefore consideration should be given to

providing more lighting in these areas. 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.

- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at all of the locations sampled. These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Campbell Readiness Center in Montpelier, Vermont. Non-Responsive performed the evaluation on 24 July 2003 and 8 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 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 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/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 hall. If there were any positive results from the drill floor, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at three locations. One sample on the assembly/drill hall floor had lead concentrations of 210 $\mu g/ft^2$. The sample obtained from the top of the soda machine in the assembly/drill hall had a lead concentration of 760 $\mu g/ft^2$. The sample obtained from the locker top surface in the assembly/drill hall had a lead concentration of 250 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 µg/ft^2 in the assembly hall, 186 FSB OPS NCO Office, and the windowsill in the basement hallway. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas with lead concentrations above 40 µg/ft^2 that will be accessible to children should be 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.

2.1.2 Air Sampling for Lead

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 and in the general area of the converted firing range: therefore, no actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Bulk sampling results revealed lead at a concentration of 0.016 percent by weight in the paint sample taken from the firing range room wall. 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. Materials suspected of containing asbestos were observed. The suspected asbestos-containing material were floor tiles in the Service Battery ORD Office, first floor classroom, supply room adjacent to the first floor classroom, copier room, 186 FSB HHD CDR TRNG NCO office, 186 FSB S4 office, lobby, 186 FSB OPS NCO S2/3 office (approximately 1182 square feet), and insulation in the boiler room (approximately 24 linear feet and 7 joints/elbows). The

condition of the floor tile materials were considered good since there was no damage to tiles. The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage).

An operation 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. Water damage and visible mold were observed on the firing range wall. In addition, a leaky pipe in the men's latrine was noted as water damage due to the precipitate that accumulates on the latrine floor.

The source of the water damage in the firing range room was likely from roof leaks or high water table and foundation leaks. The source of the water damage should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.

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

2.3.2 Indoor Air Quality

Interviews with employees revealed no indoor air quality concerns at the armory. However, measurements for humidity revealed that levels exceeded the American

Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed.

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 the HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 most areas, including the CDR's Office, Administrative Office, Recreation Room, Classroom, and Maintenance PLT Room.

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 an inactive indoor firing range used as a storage room at the facility; therefore, wipe samples were taken for lead at various locations in or near the converted range. It should be noted that the room is not occupied by personnel and is infrequently utilized. The results are provided in Table 6. The results revealed lead, with associated concentrations, at the following locations:

- bullet trap at 180000 micrograms lead per square foot ($\mu g/ft^2$);
- light fixture in the office area at 180000 $\mu g/ft^2$;
- overhead heaters in the office area at 410000 $\mu g/ft^2$;
- stored item, filing cabinet top surface at 640 $\mu g/ft^2$;
- floor in the bullet trap area at 1900 $\mu g/ft^2$; and
- floor outside the range at 300 $\mu g/ft^2$.

The lead levels at these locations were above 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). These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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 lead-based paint, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, water damage, visible mold, indoor air quality, surface lead contamination in the converted firing range, 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
Montpelier, Vermont
Dates of Sampling: 24 July 2003 and 8 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTCAM205-1	Drill Floor (See Building Layout - Appendix B)	210
VTCAM205-2	Drill Floor (See Building Layout – Appendix B)	< 110
VTCAM205-3	Drill Floor (See Building Layout -- Appendix B)	< 110
VTCAM205-4	Drill Floor (See Building Layout – Appendix B)	< 110
VTCAM205-5	Drill Floor (See Building Layout -- Appendix B)	< 110
VTCAM205-6	Field Blank	< 12 µg
VTCAM205-14	Basement-Classroom table top	< 110
VTCAM205-15	Basement-Hallway window sill	180
VTCAM205-16	1st Floor-Kitchen stove shelf	< 110
VTCAM205-17	1st Floor-SVC BTRY CDR Office-hard drive top	< 110
VTCAM205-18	Field Blank	< 12 µg
VTCAM205-19	1st Floor-186 FSB XO/AO Office-desk top	< 110
VTCAM205-20	1st Floor-Classroom-table top	< 110
VTCAM205-21	1st Floor-186 FSB CSM Office-window sill	< 110
VTCAM205-22	1st Floor-186 FSB HHD CDR Office-desktop	< 110
VTCAM205-23	1st Floor-186 FSB OPS NCO Office-desktop	180
VTCAM205-24	Field Blank	< 12 µg
VTCAM205-25	2nd Floor-desktop	< 110

[a] Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
Montpelier, Vermont
Dates of Sampling: 24 July 2003 and 8 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTCAM282-1	Assembly Room - - display case table top (See Building Layout - Appendix B)	10
VTCAM282-2	Assembly Room – desktop (See Building Layout - - Appendix B)	46
VTCAM282-3	Assembly Room – locker top surface (See Building Layout – Appendix B)	150
VT CAM282-4	Assembly Room - - soda machine top surface (See Building Layout -- Appendix B)	760
VTCAM282-5	Assembly Room - locker top surface (See Building Layout – Appendix B)	250
VTCAM282-6	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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Montpelier, Vermont
Date of Sampling: 24 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTCAM205-A1	Non-Responsive	0823 – 1106/163	2.5003	407.54	< 0.002
VTCAM205-A2		0833 – 1106/153	2.4684	377.66	< 0.003
VTCAM205-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.

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Table 3
Peeling Paint Sampling for Lead
National Guard Armory
Montpelier, Vermont
Date of Sampling: 24 July 2003

Sample Number	Location	Results, % By Weight
VTCAM205-B1	Converted Firing Range Wall	0.016

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
Montpelier, Vermont
Date of Sampling: 24 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor 185 FSB XO/AO Office	1	443	63.0	77.7
2nd Floor – Classroom/Gym	1	496	71.7	76.1
Basement - Classroom	1	424	71.9	70.3
Outdoors	-	396	69.8	75.3

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

Montpelier, Vermont

Date of Sampling: 24 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
1st Floor - Kitchen	40.3-45.1	70	No
1st Floor - Service Battery ORD Office	25.2-51.3	70	No
1st Floor - Classroom	25.3-41.3	70	No
1st Floor - 186 FSB RRO Office	33.1-57.9	70	No
1st Floor - 186 FSB XO/AO Office	25.7-104.3	70	Some Areas
1st Floor - 186 FSB HHB CDR TRNG NCO Office	16.8-56.3	70	No
1st Floor - 186 FSB S4 Office	20.1-42.3	70	No
1st Floor - 186 OPS NCO S2/3	30.1-69.3	70	No
Basement - Gym	33.6-42.3	70	No
Basement - Classroom	41.6-130.3	70	Some Areas
Basement - Men's Latrine	16.4-70.1	40	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 ANSI/IES RP-1 and RP-7.

Table 6

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Montpelier, Vermont

Date of Sampling: 24 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTCAM205-7	Bullet Trap	180000
VTCAM205-8	Light Fixture	180000
VTCAM205-9	Overhead Heaters	410000
VTCAM205-10	Stored Item - Top of filing cabinet	640
VTCAM205-11	Floor	1900
VTCAM205-13	Floor Outside the Range	300
VTCAM205-12	Blank	< 12 µg

[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(s)

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.
	Campbell Armory Vermont ARNG	Montpelier

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative OP / ADO

SURVEY DATE	EVALUATOR (Initials)
24 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
ARMY NATIONAL GUARD	XX	Non-Responsive : MAJ

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-828-2968	186 FSB	4	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
0	11	0	0	0

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			EAR PLUGS			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
POVDT XXXX	Video Display Terminal	3-low	Uncontrolled D Physical
7439-92-1	Lead, inorganic dusts and fumes as Pb	2-moderate	C Uncontrolled Respiratory
1332-21-4	Asbestos (other)	2-moderate	C Uncontrolled physical

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
See attached sheet for personnel list					

SECTION 6. COMMENTS

___No comments See attached sheet

Survey conducted by Michele Serrano, Building contains eleven (11) full time military staff. Full time staff performs mainly administrative functions

PRIVACY ACT STATEMENT

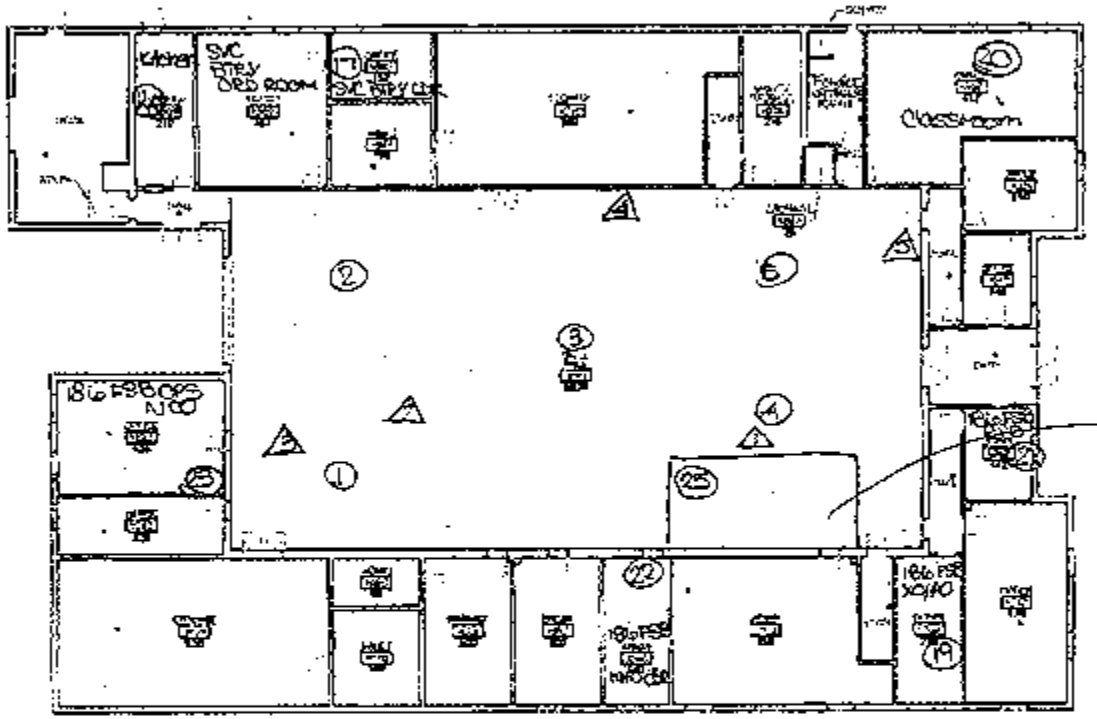
Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this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

186 FSB FTM Roster Campbell Armory, 363 Fisher Road, Montpelier, VT 05602 AS OF: 24 JUL 03			
Rank	**Last Name (SEX)**	**Position / Room**	**FTS**
MAJ	Non-Responsive (MALE)	XO & AO	Yes
CPT	(FEMALE)	RRO/Adjutant	Yes
MSG	E)	Bn Ops NCO	Yes
SFC	EMALE)	Bn S4 NCO	Yes
SFC	(FEMALE)	Bn PAC NCO	Yes
SSG	EMALE)	HHD Supply NCO	Yes
SSG	2334 (MALE)	HHD Tng / UA NCO	Yes
SPC	FEMALE)	Personnel NCO	Yes
SFC	2 (MALE)	Svc Btry Readiness NCO	Yes
SSG	LE)	Svc Btry UA	Yes
SSG		Svc Btry Supply NCO	Yes

* last 4 digits of social security number
social security numbers not available for other personnel.

Appendix B
Building Layout



○ Sample date : 24 July 2003
△ Sample date : 8 October 2003

VERMONT
Army National Guard
CAMPBELL ARMORY / 50A10

Facility Use Drawing
BUILDING A1001

Gross: 15844 SF 1472 SM	Net: 13316 SF 1237 SM	N/C Ratio: 0.840444

Sheet: 2 OF 2	Floor: FIRST	
Survey Date: -	Version: DRAFT	Drawing No. A1001_1

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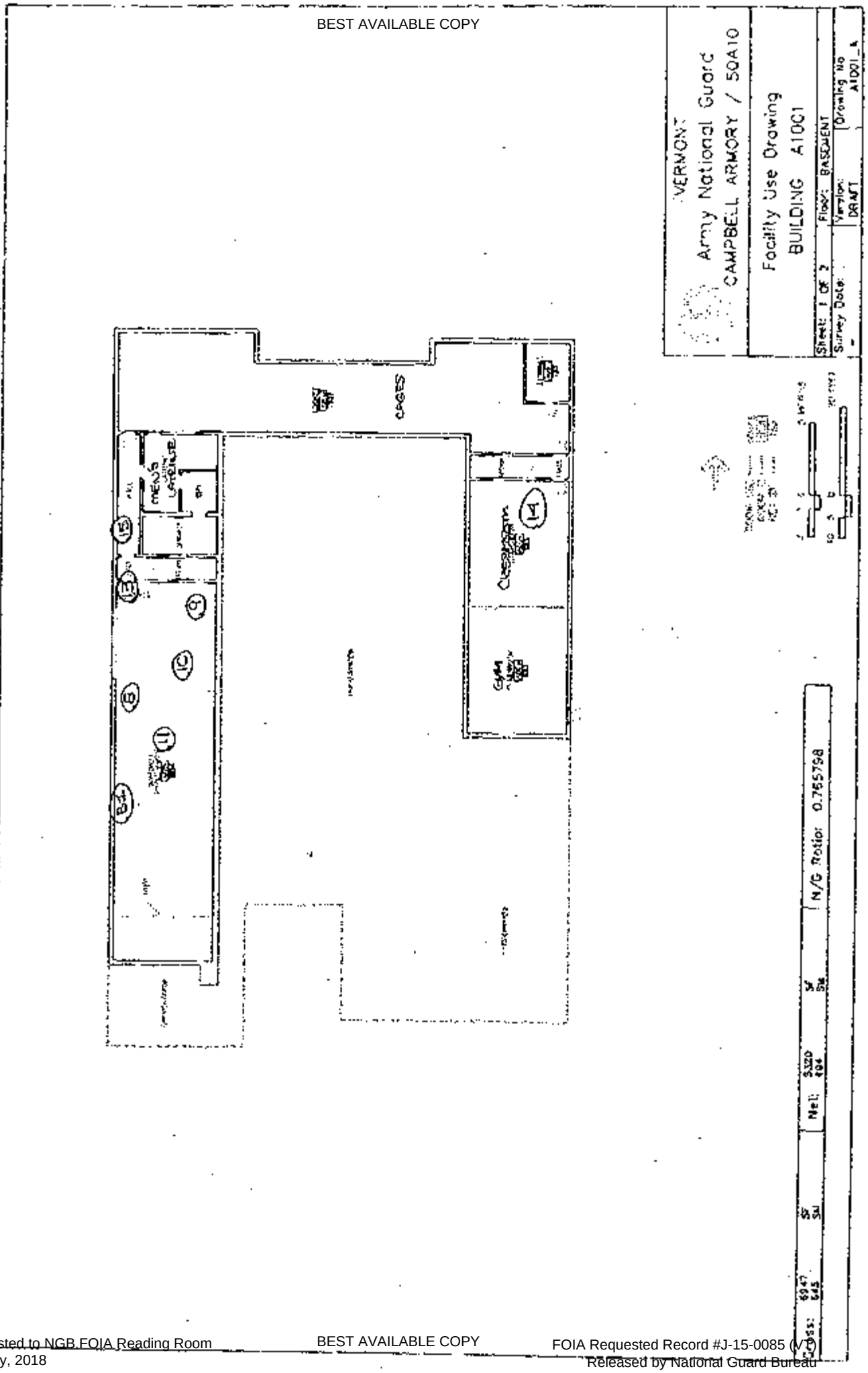

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Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTCAM205	**Chain Of Custody:**	115809
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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
0359478	VTCAM205-1	Flame	Wipe	****	0.111	108.00	ug/ft²	210	ug/ft²	
0359479	VTCAM205-2	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359480	VTCAM205-3	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359481	VTCAM205-4	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359482	VTCAM205-5	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359483	VTCAM205-6	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359484	VTCAM205-7	Flame	Wipe	****	0.111	108.00	ug/ft²	180000	ug/ft²	
0359485	VTCAM205-8	Flame	Wipe	****	0.111	108.00	ug/ft²	180000	ug/ft²	
0359486	VTCAM205-9	Flame	Wipe	****	0.111	108.00	ug/ft²	410000	ug/ft²	
0359487	VTCAM205-10	Flame	Wipe	****	0.111	108.00	ug/ft²	640	ug/ft²	
0359488	VTCAM205-11	Flame	Wipe	****	0.111	108.00	ug/ft²	1900	ug/ft²	
0359489	VTCAM205-12	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359490	VTCAM205-13	Flame	Wipe	****	0.111	108.00	ug/ft²	300	ug/ft²	
0359491	VTCAM205-15	Flame	Wipe	****	0.111	108.00	ug/ft²	180	ug/ft²	

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTCAM205	**Chain Of Custody:**	115809
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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

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]

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AMA Analytical Services, Inc.

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CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTCAM205	**Chain Of Custody:**	115917
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/18/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	07-01	**Report Date:**	18-Aug-03

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		Final Result			Comments
0362687	VTCAM205-14	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362688	VTCAM205-16	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362689	VTCAM205-17	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362690	VTCAM205-18	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362691	VTCAM205-19	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362692	VTCAM205-20	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362693	VTCAM205-21	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362694	VTCAM205-22	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362695	VTCAM205-23	Flame	Wipe	****	0.111	108.01	ug/ft²		180	ug/ft²	
0362696	VTCAM205-24	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362697	VTCAM205-25	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	

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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: Non-Responsive

Technical Manager: Non-Responsive

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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTCAM282	**Chain Of Custody:**	118709
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	0701	**Report Date:**	21-Oct-03
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		Final Result		Comments
0402862	VTCAM282 -1	Furnace	Wipe	****	0.111	2.70	ug/ft^2	10	ug/ft^2	
0402863	VTCAM282 -2	Furnace	Wipe	****	0.111	13.50	ug/ft^2	46	ug/ft^2	
0402864	VTCAM282 -3	Furnace	Wipe	****	0.111	33.75	ug/ft^2	150	ug/ft^2	
0402865	VTCAM282 -4	Furnace	Wipe	****	0.111	135.01	ug/ft^2	760	ug/ft^2	
0402866	VTCAM282 -5	Furnace	Wipe	****	0.111	67.51	ug/ft^2	250	ug/ft^2	
0402867	VTCAM282 -6	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: Non-Responsive **Technical Manager:** Non-Responsive

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DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-B1 through VTMCR203-B2
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22312 through 03-22339
Sample Receipt Date:	07/28/2003
Preparation Date:	07/29/2003
Analysis Date:	07/31/2003

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.

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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
VTCAM205-B1	03-22312	160.	0.016
VTWIN202-B1	03-22315	11000.	1.1
VTENO196-B1	03-22318	96000.	9.6
VTSTA197-B1	03-22327	1800.	0.18
VTWAT203-B1	03-22330	40.	0.0040
VTWAT203-B2	03-22331	57.	0.0057
VTMOR203-B1	03-22338	3900.	0.39
VTMOR203-B2	03-22339	11000.	1.1
	Prep Blank	ND	
% Recovery	LCS	87.	
% Recovery	03-22327 MS	* 0.	
% Recovery	03-22327 MSD	* 4.	
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.
* Low recovery due to non-homogeneous sample matrix.

Non-Responsive [redacted]

Analyst

Non-Responsive [redacted]

Reviewer

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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.

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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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			**1.**	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

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Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m^3
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
RPL			**1.**	

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

Non-Responsive

Analyst

Non-Responsive

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** CAM
Date: 205

Sample 1

Sample Number: VTCAM205-A1

Pump:	647615	
	Pre Flow Rate	**Post Flow Rate**
	2.55	2.477
	2.55	2.441
	2.542	2.451
	2.54	2.451
Average	**2.546**	**2.455**

Average Pre and Post	**2.5003**
Time 1	8:23
Time 2	11:06
Total Time Sampled	**2:43**
Minutes Sampled	163.00
Volume	**407.54 Liters**

Sample 2

Sample Number: VTCAM205-A2

Pump:	648339	
	Pre Flow Rate	**Post Flow Rate**
	2.492	2.448
	2.494	2.445
	2.494	2.445
	2.485	2.444
Average	**2.491**	**2.446**

Average Pre and Post	**2.4684**
Time 1	8:33
Time 2	11:06
Total Time Sampled	**2:33**
Minutes Sampled	153.00
Volume	**377.66 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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Berlin Readiness Center
363 Fisher Road
Montpelier, VT 05602

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 17, 2012

AEI Project #: J12-685 3M VT Berlin RC

_____

Non-Responsive, **DrPH, CIH**
Industrial Hygienist

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Berlin Readiness Center

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Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Berlin Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Berlin Readiness Center located at 363 Fisher Road, Montpelier, VT 05602 Non-Responsive , DrPH, CIH performed the evaluation on October 17, 2012. The point of contact for the facility was SFC Non-Responsive . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for three of the five samples collected from the former indoor firing range. Results from the samples collected in the firing range were between 110 and 2,300 µg/ft^2.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect asbestos-containing material was observed. The boiler room was abated and a new boiler was installed prior to the survey. Hard elbows and pipe insulation appeared to be undamaged.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. Water damage was observed in the former firing range on the lower level of the facility from what appeared to be an active water leak. Rust marks were observed on the floor of the former firing range where the lockers were stored. Facility personnel indicated that the leaks had been repaired. There was no visual or odor evidence of mold or fungus growth.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall; with the exception of water damage that has created housekeeping problems in the lower level former firing range.

Lighting: The evaluation indicated illumination deficiencies in several areas including the: FSB CSM Office, Upstairs classroom, Janitor's Closet, Assembly Hall, OPS NCO B, HHD Supply Room (area 7), HHD Vauolt, HHD Supply Room Communications Closet, Office, Stairwells, FSB RRO Office, and the Former Range Storage Area. The illumination measurements indoors ranged from 2.2 foot candles (fc) to 2,900 fc.

Indoor Air Quality: Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 67.3 to 75.0° F and 27.6 to 52.4% Rh. Temperatures and Rh measurements were mostly within the comfort ranges. The outdoor temperature and relative humidity was 59.8° F and 27.7%

on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) ranged from 444 to 764 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange. Indoor concentrations of carbon monoxide (CO) ranged from 3.2 to 4.0 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDSs were last updated in on October 17, 2012.

Other: A fiberboard drum holding discarded fluorescent lamps was observed in the lower level area that was formerly the firing range. The bottom 1/3 of the drum had evidence of water or other staining. The stain is most likely water damage related based upon a rust-colored stain of the same size and shape of the drum on the floor in the vicinity of the water leak. There were no labels on the drum indicating the contents.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Berlin Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Berlin Readiness Center located at 363 Fisher Road, Montpelier, VT 05602. Non-Responsive , DrPH, CIH performed the evaluation on October 17, 2012. The point of contact for the facility was SFC Non-Responsive The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Berlin Readiness Center was built in the early 1960's and is staffed by six military administrative personnel and one part time civilian. The operations conducted at the facility include training and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Berlin Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Berlin facility consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected by wiping a Ghost Wipe over a measured area. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for three of the five samples collected from the former indoor firing range. Results from the samples collected in the firing range were between 110 and 2,300 µg/ft^2. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Berlin Readiness Center on October 17, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft^2)*
BRC-1	Floor SVC Battery Vault, 3' South of North Wall, 6' West of East Wall	12" x 12"	14
BRC-2	Floor of Former Firing Range, 6' East of West Wall, 8' South of North Wall	9" x 8.5"	700
BRC-3	Floor of Former Range, Clean Spot Along East Wall, 20' South of North Wall from Where Cabinets Were Moved	7.5" x 8.5"	190
BRC-4	Floor of Former Range, 10' West of East Wall, 30' South of North Wall	9" x 8"	2,300
BRC-5	Top of Cabinet in Former Range	3" x 36"	110
BRC-6	Floor of Former Range, 7' West of East Wall, 6' North of South Wall	8" x 8.5"	1,800

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Berlin Readiness Center

Table 1 – Results of Dust Wipe Sampling for VT ARNG Berlin Readiness Center on October 17, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft²)*
BRC-7	Kitchen on top of Cabinet with Toaster on North Wall, 8' East of West Wall	15" x 13"	<8.9
BRC-8	Assembly Hall Floor, 18' East of West Wall, 28' South of North Wall	10" x 11"	130
BRC-9	Assembly Hall on Cafeteria Style Table Top After Weapons Inspection and Maintenance	10" x 10"	39
BRC-10	Assembly Hall Floor, 11' West of East Wall, 12' North of South Wall	12" x 12"	15
BRC-11	FSB XO/AO Office Window Sill, East Wall – North Half	13.5" x 17"	<7.5

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged, suspect asbestos-containing material was observed. The boiler room was abated and a new boiler was installed prior to the survey. Hard elbows and pipe insulation appeared to be undamaged.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. There was no visual or odor evidence of mold or fungus growth.

Standing water and rust stains were observed in the south end of the former firing range where unused lockers and equipment are currently stored. A fiberboard drum holding discarded fluorescent lamps was observed in the lower level area that was formerly the firing range. The bottom of the drum had evidence of water or other staining on the bottom 1/3 of the drum. The stain is most likely water damage related based upon a rust-colored stain of the same size and shape of the drum on the floor in the vicinity of the water leak. There were no labels on the drum indicating the contents.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall; with the exception of water damage in the lower level former firing range.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas including: FSB Office, CSM Office, Upstairs classroom, Janitor's Closet, Assembly Hall, OPS NCO B, HHD Supply Room (area 7), HHD Vault, HHD Supply Room Communications Closet, Office, Stairwells, FSB RRO Office, and the Former Range Storage Area. The illumination measurements indoors ranged from 2.2 foot candles (fc) to 2,900 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7565X, factory calibrated in July, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 67.3 to 75.0° F and 27.6 to 52.4% Rh. Temperature and relative humidity measurements were mostly within the winter comfort ranges for thermal comfort except for in the arms vault. The outdoor temperature and relative humidity was 59.8° F and 27.7% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 444 to 764 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 3.2 to 4.0 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDS were last updated in on October 17, 2012.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the Berlin Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

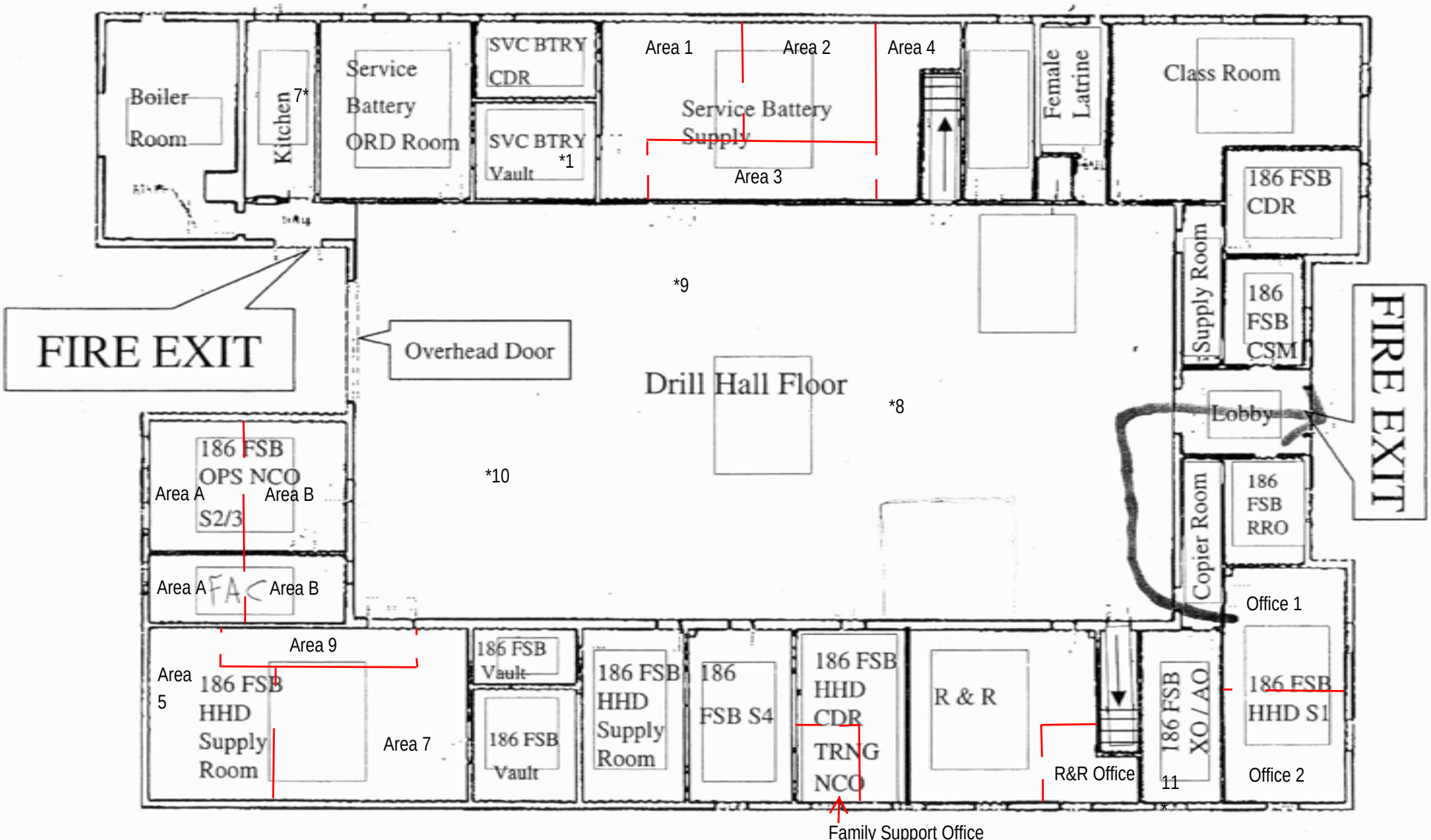
9 References

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

2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.

3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.
19. National Fire Protection Association (NFPA) 70: National Electrical Code (NEC) 2011.
20. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, November 3, 2006.

Appendix A
Building Layout



Vermont Army National Guard Campbell Armory

Fire Evacuation Plan

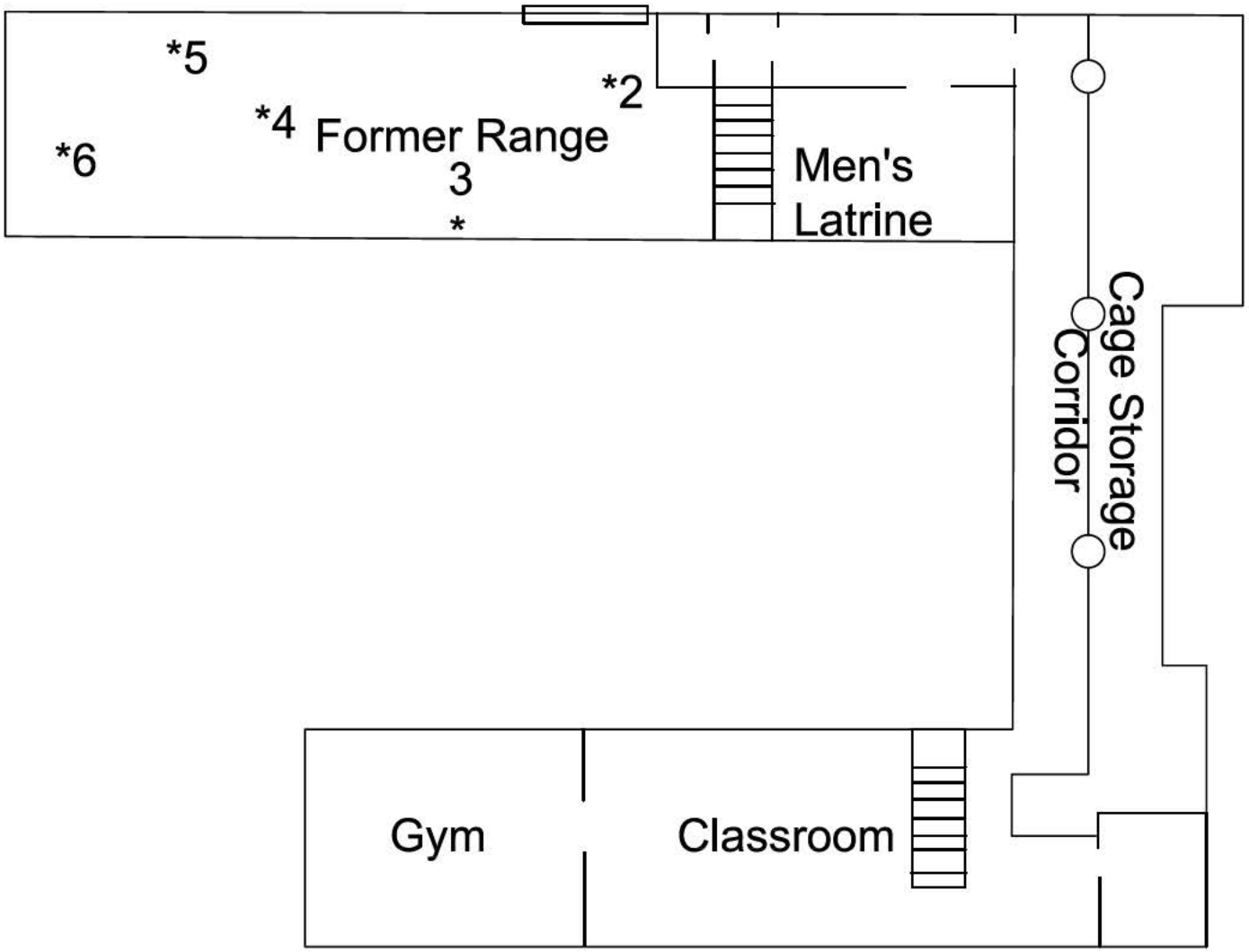
Follow the direction Marked in Red

Industrial Hygiene Survey
Berlin Readiness Center
October 17, 2012

N

First Floor

*## = Sample Location



Industrial Hygiene Survey
Berlin Readiness Center
October 17, 2012

Basement
Not to Scale
*## = Sample Location

N

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	VT ARNG 4M IH Surveys	**Chain Of Custody:**	514302
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Berlin RC	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	120685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/2/2012 **Report Date:** 11/2/2012

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
13008812	BRC-1	Flame	Wipe	****	1.000	12	ug/ft²	14	14	ug/ft²	
13008813	BRC-2	Flame	Wipe	****	0.531	23	ug/ft²	370	700	ug/ft²	
13008814	BRC-3	Flame	Wipe	****	0.443	27	ug/ft²	86	190	ug/ft²	
13008815	BRC-4	Flame	Wipe	****	0.500	24	ug/ft²	1100	2300	ug/ft²	
13008816	BRC-5	Flame	Wipe	****	0.750	16	ug/ft²	83	110	ug/ft²	
13008817	BRC-6	Flame	Wipe	****	0.472	25	ug/ft²	860	1800	ug/ft²	
13008818	BRC-7	Flame	Wipe	****	1.354	8.9	ug/ft²	<12	<8.9	ug/ft²	
13008819	BRC-8	Flame	Wipe	****	0.764	16	ug/ft²	97	130	ug/ft²	
13008820	BRC-9	Flame	Wipe	****	0.694	17	ug/ft²	27	39	ug/ft²	
13008821	BRC-10	Flame	Wipe	****	1.000	12	ug/ft²	15	15	ug/ft²	
13008822	BRC-11	Flame	Wipe	****	1.594	7.5	ug/ft²	<12	<7.5	ug/ft²	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

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Client:	National Guard Bureau	**Job Name:**	VT ARNG 4M IH Surveys	**Chain Of Custody:**	514302
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Berlin RC	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	120685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/2/2012 **Report Date:** 11/2/2012

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.

Analyst: 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) 514302

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: VTARNG 4m IH Surveys
2. Job Location: Berlin RC
3. Job #: 120685 PO #: W912K8-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Da

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: [redacted] ariaenviro.com
Comments:	☐ 2 Day Date Due: 10/31/12	☐ Fax: [redacted]
	☐ Results Required By Noon	☐ Verbals: [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)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

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

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ☐ Pb-Paint Chip (QTY)
- ☒ *Pb Dust Wipe (wipe type Ghost) 11 (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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
BRC-I Through BRC-II							✓				✓				
	SEE ATTACHED FIELD DATA SHEETS														

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: 10/24/12 @ Via: By (Print): [redacted] Sign [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Logging Room: BEST AVAILABLE COPY

Aria Environmental, Inc
SURFACE WIPE AND BULK SAMPLING
SURVEY SHEET

Date Collected: 10-17-12

Job Site: Berlin RC

Project No.: J12-685

Inspector: Non-Responsive [redacted]

Sample No.	Sample Type	Sample Location	Dimensions (Area)
BRC-1	Pb Wipe	Floor SVC Battery Vault 3' S of N, 6' W of E	12"x12"
BRC-2	↓	Floor Former Range 6' E of W, 8' S of N	9"x8.5"
BRC-3	↓	Floor of Former range Along E wall 29.5' S of N ("clean spot from where cabinets were moved)	7.5"x8.5"
BRC-4	↓	Floor of Former Range 10' W of E 30' S of N	9"x8"
BRC-5	↓	Top of cabinet in former Range	3"x36"
BRC-6	↓	Floor of Former Range 7' W of E wall, 6' N of S wall	8"x8.5"
BRC-7	↓	Kitchen on top of cabinet w/ toaster on N wall 8' E of W	15"x13"
BRC-8	↓	Assembly Hall Floor 18' E of W wall, 28' S of N	10"x11"
BRC-9	↓	Assembly Hall on cafeteria Style Table top after weapons inspection & maint	10"x10"
BRC-10	↓	Assembly Hall Floor 11' W of E wall · 12' N of S	12"x12"
BRC-11	↓	FSB XO/AO Office window sill E wall North half	13.5"x17"

Appendix C
Photo Documentation

VT Berlin RC

Photo 1: Entrance to Berlin RC.

Photo 2: Exterior of Berlin RC.

Photo 3: Entrance to the lower level of the Berlin RC.

Photo 4: Interior of Assembly Hall.

VT Berlin RC

Photo 5: Kitchen.

Photo 6: New boilers.

Photo 7: New tankless hot water heaters.

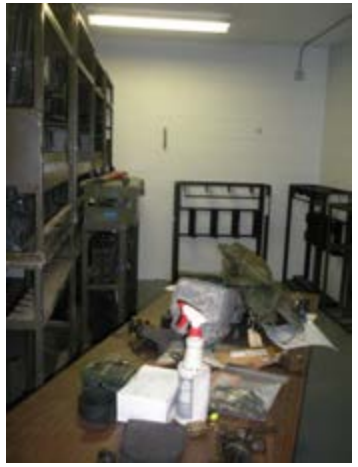

Photo 8: Arms vault.

VT Berlin RC

Photo 9: Supply room.

Photo 10: Interior of flammable materials cabinet.

Photo 11: Interior of flammable materials cabinet.

Photo 12: Maintenance area.

VT Berlin RC

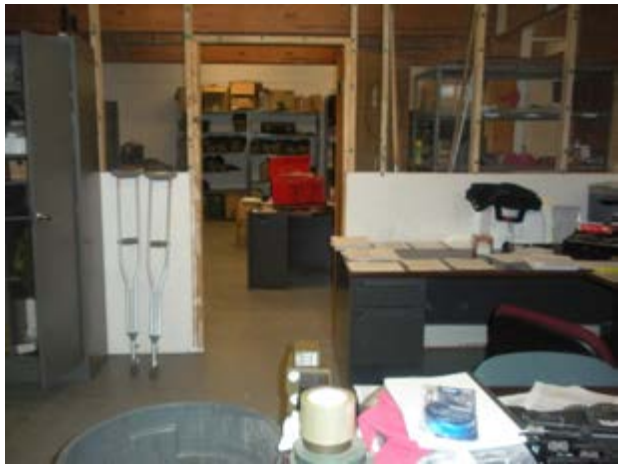

Photo 13: Supply room.

Photo 14: Former indoor firing range on lower level.

Photo 15: Evidence of water damage fluorescent lamp disposal drum.

Photo 16: Interior of flammable materials storage cabinet.

VT Berlin RC

Photo 17: Water damage from active water leak in lower level former range area.

Photo 18: Water damage from active water leak in lower level former range area.

Photo 19: Former indoor firing range.

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Berlin	IAQ								Light		
Date	10/17/2012	Inspector	Non-Responsive y	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Berlin RC			Serial Number		7575x1228004						Serial Number		K040084EL
Weather Conditions	Sunny			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Arms Vault (SVC)	Storage	1	1237	67.3	X	52.4		693		3.9		24.6		10
Service Battery - Area 1	Storage/Office	1	1245	69.9		43.2		658		3.8		36.7		30
Service Battery - Area 2	Storage	1	1246	69.9		44.6		694		3.8		23.0		10
Service Battery - Area 3	Storage Corridor	1	1247	70.0		45.1		644		4.0		34.0		10
Service Battery - Area 4	Storage	1	1248	70.0		44.9		618		3.8		23.8		10
Kitchen	Kitchen	1	1249	70.4		43.1		599		3.8		54.1		50
HHD Supply Room - Area 5	Storage	1	1253	69.9		48.6		561		3.8		20.2		10
HHD Supply Room - Area 6	Corridor	1	1254	69.9		49.1		572		3.8		13.1		10
HHD Supply Room - Area 7	Storage/Office	1	1255	69.9		48.2		582		3.8		14.0	X	30-50
HHD Vault	Vault	1	1256	69.9		48.6		581		3.8		2.2	X	10
HHD Supply Room	Communication	1	1256	70.9		44.1		610		3.7		5.7	X	30-50
FSB S4	Office	1	1257	71.3		43.2		615		3.7		32.1		30-50
Command Training NCO	Office	1	1259	71.0		35.3		547		3.5		31.0		30-50
Family Support	Office	1	1300	71.1		38.0		581		3.7		23.8	X	30-50
Conference Room	Conference Roon	1	1302	70.6		42.2		589		3.8		76.2		30-50
R&R	Office	1	1304	70.6		43.9		604		3.6		47.3		30-50
Office	Office	1	1305	70.5		44.1		604		3.8		20.4	X	30-50
Stairwell (East)	Corridor	1	1306	70.3		43.8		537		3.6		4.9	X	5
Copier Room	Office	1	1307	70.2		44.3		634		4.0		44.4		30-50
FSB XO/AO	Office	2	1308	70.3		43.6		629		3.7		30.8		30-50
FSB RRO	Office	1	1310	71.2		42.8		632		3.7		19.9	X	30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Berlin	IAQ								Light		
Date	10/17/2012	Inspector	[redacted]	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Berlin RC			Serial Number		7575x1228004						Serial Number		K040084EL
Weather Conditions	Sunny			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Office 1	Office	1	1311	71.0		43.6		727		3.8		49.3		30-50
Office 2	Office	1	1312	70.8		43.8		764		3.8		52.2		30-50
Entry Vestibule	Lobby	var	1313	71.1		42.5		606		3.5		12.7		10
FSB CSM	Office	1	1315	71.2		41.9		598		3.7		19.6	X	30-50
Supply	Corridor	1	1316	71.3		42.5		600		3.8		17.4		5
FSB CDR	Office	1	1317	71.8		42.2		591		3.7		31.3		30-50
Classroom	Classroom	var	1318	72.1		41.4		579		3.7		28.1	X	30-50
Female Latrine	Latrine	var	1319	72.2		42.8		577		3.7		30.3		5
Janitor's Closet	Closet	1	1320	71.9		42.7		696		3.7		no light	X	30
Assembly Hall	Hallway	var	1321	71.6		41.6		611		3.8		15.8	X	30-50
Service Battery CDR	Office	1	1323	74.8		44.8		494		3.2		33.1		30-50
Service Battery ORD Room	Office	1	1324	75.0		39.2		617		3.7		39.0		30-50
Boiler Room	Boiler Room	1	1326	71.1		27.6	X	456		3.7		2.9 K		30
Outdoors	Outdoors	1	1327	59.8		27.7		402		3.9		8.4 K		N/A
Ops NCO A	Office	1	1330	70.4		43.5		609		3.3		42.3		30-50
Ops NCO B	Conference Room	var	1330	70.8		43.2		624		3.3		28.4	X	30-50
FAC A	Office	1	1331	71.1		43.1		604		3.3		48.3		30-50
FAC B	Lounge	1	1331	71.2		42.8		610		3.4		64.9		30-50
Gym	Gym	var	1400	68.1		40.8		467		3.3		33.0		30
Classroom	Classroom	var	1405	68.6		41.2		473		3.3		52.2		30-50
East Stairs	Corridor	var	1406	68.5		41.2		480		3.3		29.2		5

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Berlin	IAQ								Light		
Date	10/17/2012	Inspector	Non-Responsive y	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Berlin RC			Serial Number		7575x1228004						Serial Number		K040084EL
Weather Conditions	Sunny			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Corridor	Corridor	var	1407	68.5		44.5		491		3.4		12.6		5
West Corridor	Corridor	var	1408	68.5		45.8		503		3.4		12.8		5
West Stairs	Corridor	var	1409	68.7		43.2		488		3.3		24.1		5
Men's Latrine	Latrine	var	1409	69.0		52.1		544		3.8		15.8		5
Former Range	Lockers/Storage	var	1410	68.9		42.1		444		3.3		2.9	X	7

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Shaw® Shaw Environmental, Inc.

National Guard Armory
Morrisville Readiness Center – Morrisville, Vermont

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

11 December 2003

National Guard Armory
Morrisville Readiness Center – Morrisville, Vermont

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11 December 2003

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

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Executive Summary

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Morrisville Readiness Center in Morrisville, Vermont. Non-Responsive performed the evaluation on 22 July 2003 and 8 October 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 Exposure
- Lighting
- Converted Indoor Firing Range
- 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
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation

- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at four locations in the assembly/drill hall. It is recommended that these surfaces and the areas immediately around these surfaces 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall. 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.
- Peeling paint was observed in the converted firing range room, and bulk sampling results revealed this paint to be a lead-based paint. Anyone who may perform repair and/or maintenance activities on this surface should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be taken.
- 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 was likely from roof leaks. It was indicated that the roof is to be replaced within the year. The source of the water should be confirmed 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 that the humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the supply room where there is a minimal fresh air supply. A fan can be used for cooling purposes and to circulate air in the supply room.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in most areas; therefore consideration should be given to

providing more lighting in these areas. 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.

- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at all of the locations sampled. These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in these areas without protective clothing until the areas are cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Morrisville Readiness Center in Bradford, Morrisville. Non-Responsive performed the evaluation on 22 July 2003 and 8 October 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 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 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/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 hall. If there were any positive results from the drill floor, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at four locations. Two samples on the assembly/drill hall floor (sample locations four and five) had lead concentrations of 220 and 260 $\mu g/ft^2$, respectfully. The sample obtained from the top of the soda machine in the assembly/drill hall had a lead concentration of 270 $\mu g/ft^2$. The sample obtained from the fire alarm control box in the assembly/drill hall had a lead concentration of 400 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 µg/ft^2 in the assembly hall. 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 for Lead

Breathing zone air sampling was conducted on one (1) full-time building occupant. (Please note that no state employees were monitored.) In addition, a general air sample was collected in the converted firing range. 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 and in the general area of the converted firing range: therefore, no actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Bulk sampling results revealed lead at a concentration of 1.1 percent by weight in the paint sample taken from the converted firing range room. The results of the sampling are provided in Table 3.

Anyone who may perform repair and/or maintenance activities on surfaces coated with lead-based paint should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be taken.

It should be noted that the firing range lead wipe sampling results (See Section 2.8) indicate lead concentrations above the recommended level of 200 µg/ft^2, therefore the

possibility exists that the lead concentration indicated by the paint sample taken from the firing range room could be due to deposition rather than lead based paint.

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 material were floor tiles in the Administrative Office, R & R Office, ISG Office, Classroom, Maintenance PLT Room, and 2 Kitchen storage rooms (approximately 1641 square feet), and insulation in the boiler room (approximately 33 linear feet). The condition of the floor tiles materials was considered average since there was some damage to tiles at the doorways. The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage).

An operation 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 in the Maintenance PLT Room, Women's Latrine, Men's Latrine, Recreation room, and the ISG Office.

The source of the water damage was likely from roof leaks. It was indicated that the roof is to be replaced within the year. The source of the water damage should be confirmed 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 and observation of work activities revealed no ergonomic concerns at the armory.

2.2.4 Indoor Air Quality

Interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the supply room where there is a minimal fresh air supply. . In addition, measurements for humidity revealed that levels exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition a fan can be used for cooling purposes and to circulate air in the supply room.

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 HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 most areas, including the CDR's Office, Administrative Office, Recreation Room, Classroom, and Maintenance PLT Room.

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 converted range. The space was divided into storage and an office area used only on drill weekends. It should be noted that a blue tarp was hung between the bullet trap area and the rest of the room. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- floor outside the range at 250 micrograms lead per square foot ($\mu g/ft^2$);
- floor in the office area at 250 $\mu g/ft^2$;
- light fixture in the office area at 1600 $\mu g/ft^2$;
- floor in the bullet trap area at 8800 $\mu g/ft^2$;
- light fixture in the bullet trap area at 760 $\mu g/ft^2$; and
- inside remaining ventilation ductwork at 5000 $\mu g/ft^2$.

The lead levels at these locations were above 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). These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of

cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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, visible mold, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, peeling lead-based paint, suspected asbestos-containing material, water damage, indoor air quality, surface lead contamination in the converted firing range, 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
Morrisville, Vermont
Dates of Sampling: 22 July 2003 and 8 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTMOR203-1	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTMOR203-2	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTMOR203-3	Drill Floor – On Floor (See Building Layout – Appendix B)	130
VTMOR203-4	Drill Floor – On Floor (See Building Layout – Appendix B)	220
VTMOR203-5	Drill Floor – On Floor (See Building Layout – Appendix B)	260
VTMOR203-6	Field Blank	< 12 µg
VTMOR203-15	Classroom Table Surface	< 110
VTMOR203-16	Kitchen Top of Cabinet	<110
VTMOR203-17	Supply Room Office Desktop	<110
VTMOR203-18	Field Blank	< 12 µg
VTMOR203-19	Administrative Office Desktop	< 110
VTMOR203-20	Office Top of Bookshelf	< 110
VTMOR282-1	Assembly Room – Top of Soda Machine (See Building Layout – Appendix B)	270
VTMOR282-2	Assembly Room – Top of Locker #71 (See Building Layout – Appendix B)	21
VTMOR282-3	Assembly Room – Top of Fire Alarm Control Box (See Building Layout – Appendix B)	400
VTMOR282-4	Assembly Room – Top of Locker #29 (See Building Layout – Appendix B)	66
VTMOR282-1	Assembly Room – Top of Locker #50 (See Building Layout – Appendix B)	37
VTMOR282-6	Field Blank	0.33 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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Morrisville, Vermont
Date of Sampling: 22 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTMOR203-A1	Non-Responsive	0851-1111/140	2.4745	346.43	<0.003
VTMOR203-A2	General sample-firing range office	0853-1113/140	2.4904	348.65	<0.003
VTMOR203-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
Morrisville, Vermont
Date of Sampling: 22 July 2003

Sample Number	Location	Results, % By Weight
VTMOR203-B1	Women's Latrine wall	0.39
VTMOR203-B2	Converted Firing Rang Wall	1.1

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
Morrisville, Vermont
Date of Sampling: 22 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor -	2	435	74.9	73.4
Outdoors	0	421	78.3	84.6

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.

Table 5

Illumination Readings

National Guard Armory

Morrisville, Vermont

Date of Sampling: 22 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
CDR's Office	43.7-28.6	70	No
Administrative Office	51.8-14.6	70	No
Recreation Room	55.3-20.6	70	No
Classroom	54.9-23.1	70	No
Maintenance PLT Room	60.1-26.3	70	No
Kitchen	85.6-20.5	70	Some areas
Supply Room/Office	73.2-32.2	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.

Table 6

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Morrisville, Vermont

Date of Sampling: 22 July 2003

Sample Number	Location	Results, µg/ft^2 [a]
VTMOR203-7	Inside Remaining Ventilation Ductwork	5000
VTMOR203-8	Light Fixture - Office Area	1600
VTMOR203-9	Light Fixture - Bullet Trap Area	760
VTMOR203-10	Stored Item - Office Area (Cabinet Top)	<110
VTMOR203-11	Floor - Office Area	250
VTMOR203-12	Field Blank	<12 µg
VTMOR203-13	Floor - Bullet Trap Area	8800
VTMOR203-14	Floor Outside the Range	250

[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.

Appendix A
HHIM Data Form(s)

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.
	Morrisville Armory Vermont ARNG	Morrisville

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative OP / ADO
SURVEY DATE	**EVALUATOR (Initials)**
22 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-888-4416	C/1-172 AR, FTS	5	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
0	4	0	0	0

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/FT	R	U
CHEMICAL SPLASH			CANAL CAPS			APRONS			COLD WEATHER BOOTS/HATS		
FULL FACE SHIELD			EAR PLUGS			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					

AEHA Form 271-R (Test) 1 Jan 92 (HSHB-MI-I)

SECTION 4. HAZARD INVENTORY DATA

CAS CODE	HAZARD DESCRIPTION	PAC	EPC
POVDTKXXX	Video Display Terminal	3-low	Uncontrolled Peripheral
1332-21-4	Asbestos (Other)	2-moderate	Uncontrolled Respiratory
7439-92-	Lead, Inorganic dust and fumes	2-moderate	Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
[redacted]		D	M	not available	1
		L			
		E			
		W	d	d	1

SECTION 6. COMMENTS

No comments — See attached sheet

Survey conducted by Michele Seman. contain 4 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.

C/1-172 AR FTS Roster

1SG [redacted] ess NCO

SSG [redacted] . – Training NCO

SSG [redacted] Sergeant

SSG [redacted] R NCO

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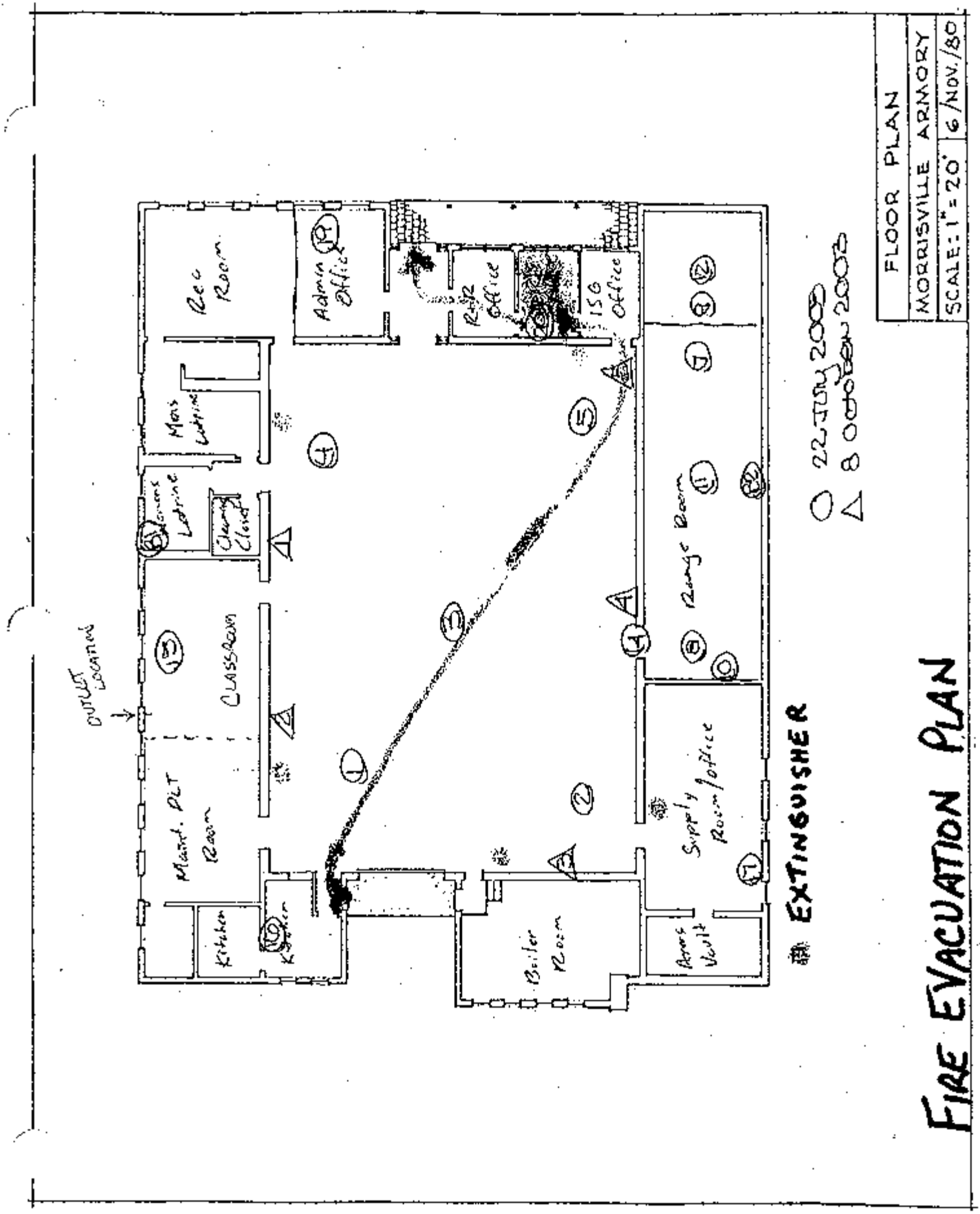
Appendix B
Building Layout



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:**	VTMOR203	**Chain Of Custody:**	115813
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/05/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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
0359523	VTMOR203-1	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359524	VTMOR203-2	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359525	VTMOR203-3	Flame	Wipe	****	0.111	108.00	ug/ft²		130	ug/ft²	
0359526	VTMOR203-4	Flame	Wipe	****	0.111	108.00	ug/ft²		220	ug/ft²	
0359527	VTMOR203-5	Flame	Wipe	****	0.111	108.00	ug/ft²		260	ug/ft²	
0359528	VTMOR203-6	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0359529	VTMOR203-7	Flame	Wipe	****	0.111	108.00	ug/ft²		5000	ug/ft²	
0359530	VTMOR203-8	Flame	Wipe	****	0.111	108.00	ug/ft²		1600	ug/ft²	
0359531	VTMOR203-9	Flame	Wipe	****	0.111	108.00	ug/ft²		760	ug/ft²	
0359532	VTMOR203-10	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359533	VTMOR203-11	Flame	Wipe	****	0.111	108.00	ug/ft²		250	ug/ft²	
0359534	VTMOR203-12	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0359535	VTMOR203-13	Flame	Wipe	****	0.111	108.00	ug/ft²		8800	ug/ft²	
0359536	VTMOR203-14	Flame	Wipe	****	0.111	108.00	ug/ft²		250	ug/ft²	

An AIHA (#8863), NVLAP (# 101143), & New York ELAP (#10920) Accredited Laboratory

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTMOR203	**Chain Of Custody:**	115813
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/05/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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

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] Non-Responsive

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CERTIFICATE OF ANALYSIS

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Client:	National Guard Bureau	**Job Name:**	VTMOR203	**Chain Of Custody:**	115919
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/18/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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
0362704	VTMOR203-15	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362705	VTMOR203-16	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362706	VTMOR203-17	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362707	VTMOR203-18	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362708	VTMOR203-19	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362709	VTMOR203-20	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	

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]

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

NVLAP
NY ELAP
AIHA

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	VTMOR203	**Chain Of Custody:**	115813
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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

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

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTMOR282	**Chain Of Custody:**	118707
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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
0402850	VTMOR282 -1	Furnace	Wipe	****	0.111	67.51	ug/ft²	270	ug/ft²	
0402851	VTMOR282 -2	Furnace	Wipe	****	0.111	2.70	ug/ft²	21	ug/ft²	
0402852	VTMOR282 -3	Furnace	Wipe	****	0.111	67.51	ug/ft²	400	ug/ft²	
0402853	VTMOR282 -4	Furnace	Wipe	****	0.111	13.50	ug/ft²	66	ug/ft²	
0402854	VTMOR282 -5	Furnace	Wipe	****	0.111	5.40	ug/ft²	37	ug/ft²	
0402855	VTMOR282 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.33	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] Non-Responsive

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DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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.

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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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

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Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m^3
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** MOR
Date: 203

Sample 1

Sample Number: VTMOR203-A1
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.51	2.442
	2.508	2.445
	2.502	2.441
	2.511	2.437
Average	**2.508**	**2.441**

Average Pre and Post **2.4745**

Time 1	8:51
Time 2	11:11
Total Time Sampled	**2:20**
Minutes Sampled	140.00

Volume **346.43 Liters**

Sample 2

Sample Number: VTMOR203-A2
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.525	2.459
	2.516	2.468
	2.513	2.469
	2.512	2.461
Average	**2.517**	**2.464**

Average Pre and Post **2.4904**

Time 1	8:53
Time 2	11:13
Total Time Sampled	**2:20**
Minutes Sampled	140.00

Volume **348.65 Liters**

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-B1 through VTMCR203-B2
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22312 through 03-22339
Sample Receipt Date:	07/28/2003
Preparation Date:	07/29/2003
Analysis Date:	07/31/2003

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
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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
VTCAM205-B1	03-22312	160.	0.016
VTWIN202-B1	03-22315	11000.	1.1
VTENO196-B1	03-22318	96000.	9.6
VTSTA197-B1	03-22327	1800.	0.18
VTWAT203-B1	03-22330	40.	0.0040
VTWAT203-B2	03-22331	57.	0.0057
VTMOR203-B1	03-22338	3900.	0.39
VTMOR203-B2	03-22339	11000.	1.1
	Prep Blank	ND	
% Recovery	LCS	87.	
% Recovery	03-22327 MS	* 0.	
% Recovery	03-22327 MSD	* 4.	
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.
* Low recovery due to non-homogeneous sample matrix.

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]
Reviewer

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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Morrisville Readiness Center

415 Farr Avenue
Morrisville, VT 05661

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 26, 2011

AEI Project #: J11-601 4L VT Morrisville RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

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Morrisville Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Morrisville Readiness Center located at 415 Farr Avenue, Morrisville, VT 05661. Non-Responsive, CIH, CSP performed the evaluation on October 26, 2011. The point of contact for the facility was SGT Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed in the facility. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for a sample collected on the bay door in the Drill Hall (270 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect material was observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. A water stain was observed on the Fitness Center ceiling. No evidence of wet areas or mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed improvement. Floors were dirty, and dust had accumulated on many of the horizontal surfaces. Unlike several other Vermont Readiness Centers that were surveyed, this Readiness Center does not have a custodian.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the storage locker, the kitchen, the family readiness room, the supply office and the boiler room. The illumination measurements indoors ranged from 3 foot candles (fc) to 75 fc.

Indoor Air Quality: Temperature and relative humidity measurements were within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 55.3° F and 36.3% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDSs for some new custodial products were required per OSHA 29 CFR 1910.1200.

Overall, the Morrisville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Morrisville Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Morrisville Readiness Center located at 415 Farr Avenue, Morrisville, VT 05661. Non-Responsive CIH, CSP performed the evaluation on October 26, 2011. The point of contact for the facility was SGT Non-Responsive . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Morrisville Readiness Center was built in the 1950's. The readiness center is staffed by 6 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Morrisville Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Morrisville facility consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the ledge of the bay door in the Drill Hall (270 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Morrisville Readiness Center on October 26, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
MOR – 01	Former Firing Range – bullet trap area – floor	<110
MOR – 02	Former Firing Range – metal stand	<110
MOR – 03	Former Firing Range – metal tool case	<110
MOR – 04	Former Firing Range – metal shelf	<110
MOR – 05	Former Firing Range – counter	<110
MOR – 06	Drill Hall – floor	<110
MOR – 07	Drill Hall – table	<110
MOR – 08	Drill Hall – bay door ledge	**270**
MOR – 09	Drill Hall – chemical storage cabinet	160
MOR – 10	Drill Hall – floor	<110
MOR – 11	Kitchen – serving counter	<110
MOR – 12	Supply Room – floor	<110

Table 1 – Results of Dust Wipe Sampling for VT ARNG Morrisville Readiness Center on October 26, 2011.

Wipe Sample #	Sample Location	Result (µg/ft²)*
MOR – 13	Gym - floor	<110

*The recommended maximum level for adult exposures is 200 µg/ft² lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect ACM was observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. A water stain was observed in the fitness center. No wet areas or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed improvement. Floors were dirty, and dust had accumulated on many of the horizontal surfaces. Unlike several other Vermont Readiness Centers that were surveyed, this Readiness Center does not have a custodian.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on March 9, 2011, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas: the storage locker, the kitchen, the family readiness room, the supply office and the boiler room. The illumination measurements indoors ranged from 3 foot candles (fc) to 75 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in February, 2011. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 70.1 to 73.5° F and 32.1 to 47.9% Rh. Temperatures and relative humidity were within the summer comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 55.3° F and 36.3% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 508 to 862 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.5 to 1.3 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDSs for some new custodial products were required per OSHA 29 CFR 1910.1200.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, peeling potentially lead-based paints, noise hazards, visible mold and the presence of damaged suspect asbestos-containing materials. The results of the evaluation indicated industrial hygiene concerns in the following areas: accumulated lead-containing dust in one area, lighting, MSDS updates and housekeeping. Overall, the Morrisville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

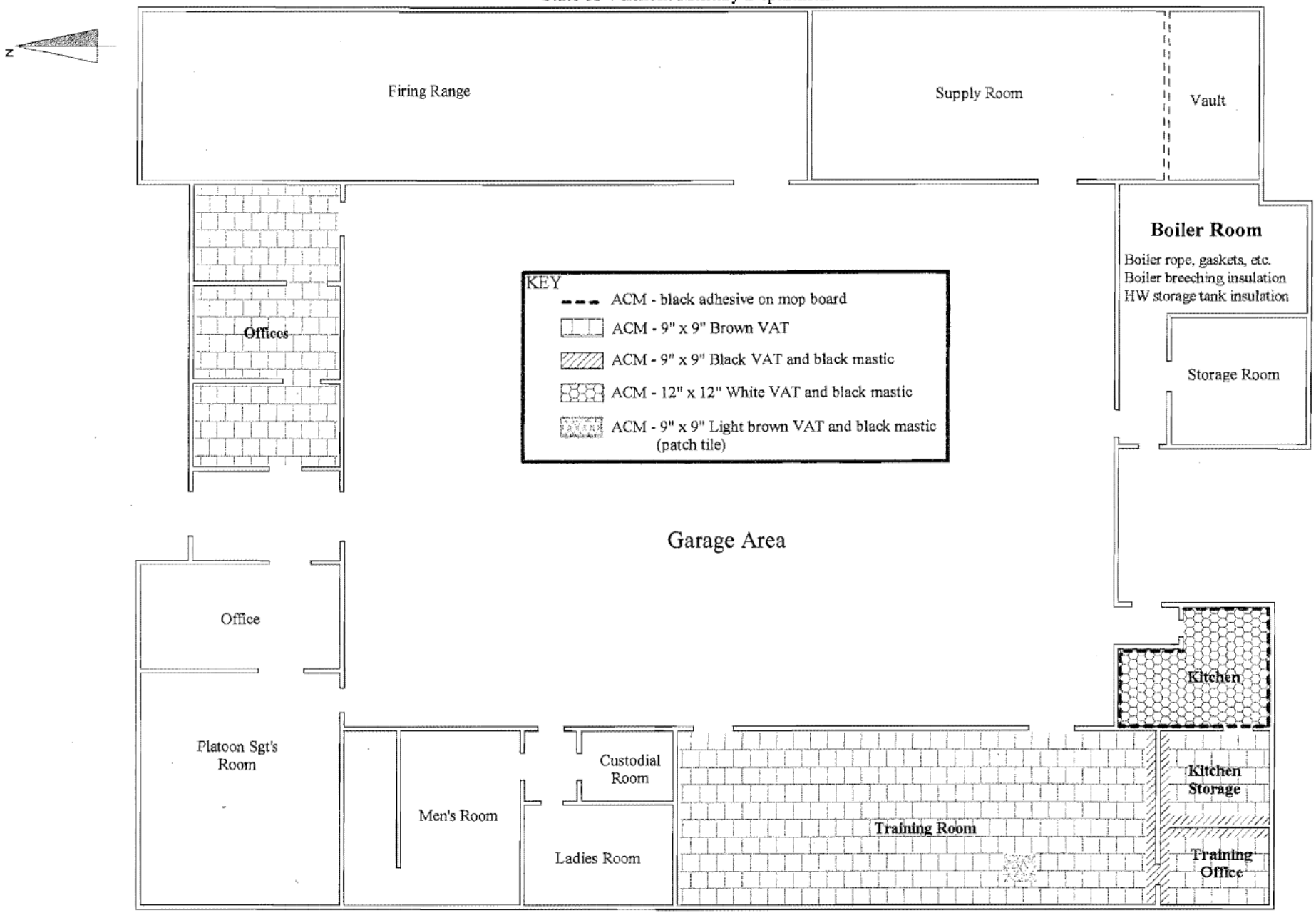
9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 10 October 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 28 March 2009.
8. Army Regulation (AR) 420-1 Army Facilities Management, 28 March 2009.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.

13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout

State of Vermont Military Department



First Floor

Prepared by: AIM Group Environmental Consultants Morrisville, Vermont	Morrisville Armory - Project # 9800307
	Asbestos-Containing Material Locations
	Scale: 1/16"=1'0" (+/-)
	December 1, 1997
	ACM-1

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	Morrisville RC	**Chain Of Custody:**	511727
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Morrisville, VT	**Date Submitted:**	11/1/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011
Attention:	Non-Responsive				**Report Date:** 11/8/2011

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
12010513	Mor-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010514	Mor-02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010515	Mor-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010516	Mor-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010517	Mor-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010518	Mor-06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010519	Mor-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010520	Mor-08	Flame	Wipe	****	0.111	110	ug/ft²	30	270	ug/ft²	
12010521	Mor-09	Flame	Wipe	****	0.108	110	ug/ft²	17	160	ug/ft²	
12010522	Mor-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010523	Mor-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010524	Mor-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010525	Mor-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Morrisville RC	**Chain Of Custody:**	511727		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Morrisville, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011

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.

Analy Non-Responsive

Technical Manag 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

OWL (410) 247-2024

189202 210 REV 6.08

CHAIN OF CUSTODY

(Please Refer To Number For Inqui

511727

P. 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-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: Morrisville RC
2. Job Location: Morrisville, VT
3. Job #: 511-601
4. Contact Perso [redacted] #: W912K8-09-A-0003
5. Submitted by: [redacted] @ [redacted]

[redacted] nature: [redacted]

Reporting Information (Results will be provided [redacted] reply template):

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: 11/8/11
- ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
- ☒ Include [redacted] Report
- ☐ Email: [redacted] aria-enviro.com
- ☐ Fax: [redacted] us.army.mil
- ☐ Verbo [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) 10X10
- ☐ Pb Dust Wipe (wipe type chest) 12 (QTY) 13 Total
- ☐ 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 (Cm2)
Mor-01		10/26		100
02				
03				
04				
05				
06				
07				↓
08				103.2
09				100
10				
11				↓
↓ – 12		↓		↓

ANALYSIS

ITEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WIPE (SWAB)	BULK	TAPE	SWAB
			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: 11/1/11 @ 1105 Via: FedEx By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time:
4. Comments: 7958 7173 2377

[redacted]

OWI (410) 247-2024

189202 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) 511727 p. 2/2 (2)

Mailing/Billing Information:
1. Client Name: National Guard Bureau
2. Address 1: 301-IH Old Bay Lane
3. Address 2: Attn: NGB-AVN-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: Morrisville RC
2. Job Location: Morrisville, VT
3. Job #: J11-601
4. Contact Pers[redacted] Non-Responsive W912K6-09-A-0003
5. Submitted by[redacted] @ [redacted] Signature: [redacted] Non-Responsive

Reporting Information (Results will be provided [redacted]):

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 (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
- ☒ Include [redacted] Non-Responsive with Report
- ☒ Email: [redacted] ariaenviro.com
- ❑ Fax: [redacted] @us.army.mil
- ❑ Verbal: [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 Ghost) 1 (QTY) (13 total)
- ❑ 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	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Mor-13		10/26		100				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: ____ Initials: ____

Appendix C
Photo Documentation

Morrisville, VT Readiness Center

Morrisville RC Exterior

Drill Hall

Storage – Former Firing Rang

Storage – Former Firing Range 2

Morrisville, VT Readiness Center

Bullet Trap Area of Former Firing Range

Improperly stored flammable liquid canisters

Classroom

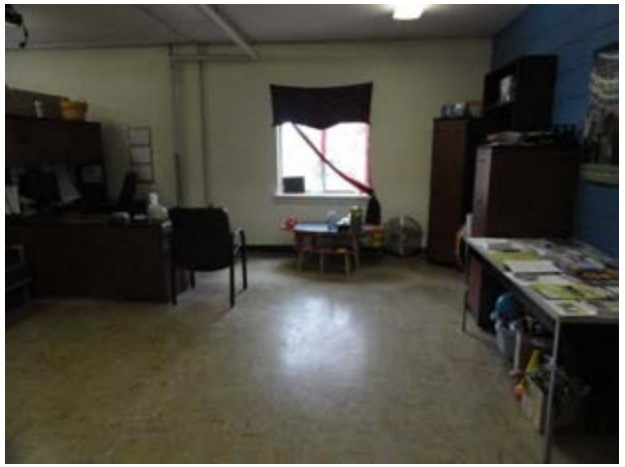
View of Kitchen

Morrisville, VT Readiness Center

Kitchen

Kitchen 2

Kitchen 3



Family Readiness Room

Morrisville, VT Readiness Center

Janitor's Closet

Janitor's Closet 2

Janitor's Closet 3

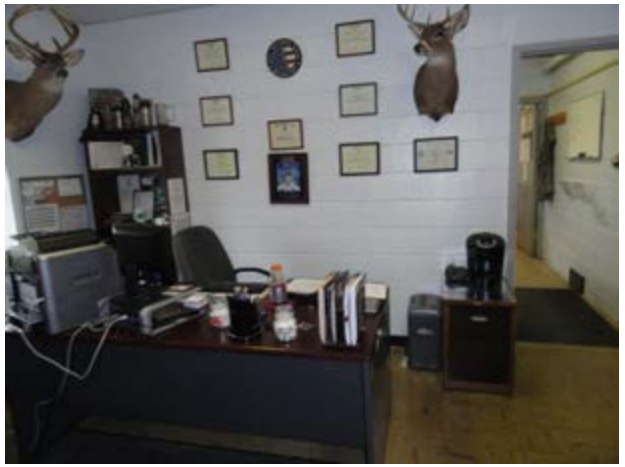
Fitness Center

Morrisville, VT Readiness Center

Water Damage on Ceiling

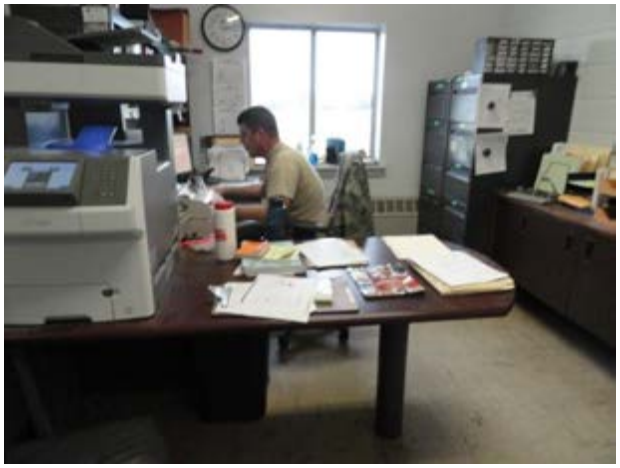
Fitness Center

CDR/1SG Office

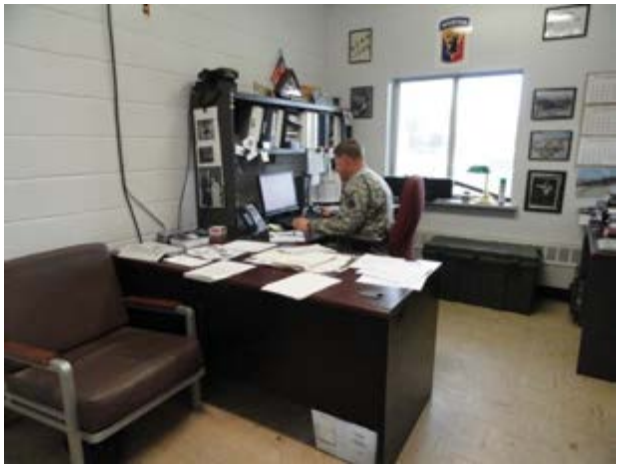


Recruiting Office

Morrisville, VT Readiness Center



Office

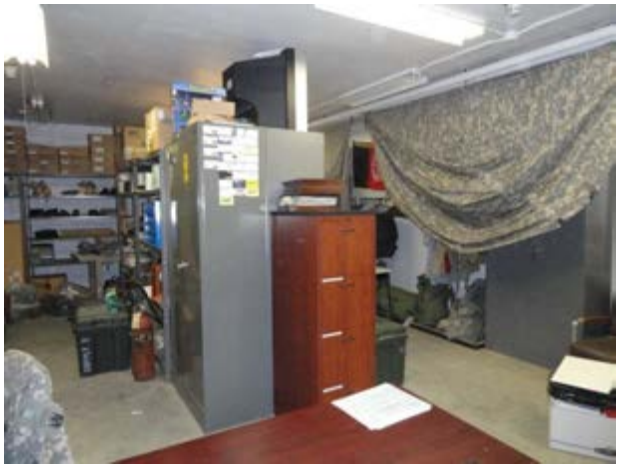


Office

Drill Hall 2

Flammable Storage Cabinets

Morrisville, VT Readiness Center



Supply Room

Supply Room

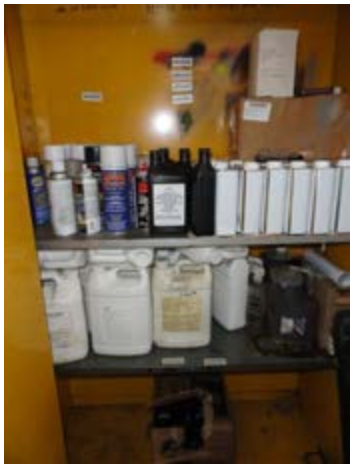
Boiler Room

Boiler Room 2

Morrisville, VT Readiness Center

Boiler Room Pipe Insulation

Boiler Room Pipe Insulation



Flammable Storage Cabinet 2

MSDS Notebook

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Morrisville	IAQ								Light	
Date	10/26/2011	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument	Cal-Light 400
Facility Description	Morrisville RC			Serial Number		7565X0839020						Serial Number	K070003
Weather Conditions	Cool, Clear			Last Calibration		Feb-11						Last Calibration	9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Storage Locker		1	14:40	70.1		47.9		532		1.0		5-40	X	7
Classroom		1	15:17	71.8		36.1		572		1.3		30-75		30-50
Kitchen		1	15:18									35-40	X	50
Kitchen Storage		1	15:18	71.2		32.1		509		0.6		17-25		5
Family Readiness		1	15:21	70.5		36.9		597		0.7		10-48	X	30-50
JC		1	15:22									42		30
Ladies Restroom		1	15:22	71.1		43.5		508		0.6		33		5
Gym		1	15:23	70.9		38.1		625		1.2		30-55		30-50
Foyer		1										20		10
CDR/1SG Office		1	15:25	71.3		39.4		688		1.0		30-40		30-50
R&R Office		2	15:25	72.3		38.5		668		0.9		30-45		30-50
Admin Office		2	15:26	73.3		38.1		695		1.0		40-55		30-50
Readiness NCO Office		2	15:28	73.5		36.8		673		0.7		30-55		30-50
Supply Office		3	15:29	72.3		41.7		862		1.3		3-55	X	30-50
Boiler Room		1	15:31	73.5		35.8		620		0.5		6-30	X	30
Storage Room		1	15:32									30		30
Drill Hall		1	15:35	71.7		37.4		630		1.0		40-70		30-50
Outside			16:15	55.3		36.3		419		1.4				

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Morrisville Readiness Center
415 Farr Avenue
Morrisville, VT 05661

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 17, 2012

AEI Project #: J12-685 3M VT Morrisville RC

Non-Responsive, **DrPH, CIH**
Industrial Hygienist

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Morrisville Readiness Center

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Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Morrisville Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Morrisville Readiness Center located at 415 Farr Avenue, Morrisville, VT 05661. Non-Responsive, DrPH, CIH performed the evaluation on October 17, 2012. The point of contact for the facility was SGT Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the exterior of the facility. Samples were collected from the porch ceiling and an exterior metal door. The peeling, flaking and chipping paint on the porch ceiling is lead-based paint. The paint on the exterior door is not lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot ($\mu g/ft^2$)) in all areas sampled except for a sample collected from the floor in the Drill Hall (270 $\mu g/ft^2$).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. The only damaged suspect asbestos-containing material was limited to small areas of broken floor tile in the office area.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of water intrusion or mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall. One area of concern was observed in the Drill Hall. Oily rags were stored in plastic bags in the flammable materials storage cabinet that also contained propane cylinders. The POL storage cabinet doors do not close properly. This is a fire and life safety hazard as the cabinets are in the route of egress to the supply room and arms vault.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas: the platoon room, Office 1, the gym, the janitor's closet, FSC Office, maintenance, the kitchen and the boiler room. The illumination measurements indoors ranged from 13.7 foot candles (fc) to 82.0 fc.

Indoor Air Quality: Temperature measurements fell just below the comfort range for the winter season in all but five of the locations measured. Relative humidity measurements were within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 46.5º F and 39.5% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas. A diesel

powered fork lift was parked inside the drill hall on the day of monitoring. The use of diesel powered equipment indoors may contribute to unsafe carbon monoxide concentrations.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDS were last updated in July of 2009. MSDSs for some new custodial products were required per OSHA 29 CFR 1910.1200.

Overall, the Morrisville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Morrisville Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Morrisville Readiness Center located at 415 Farr Avenue, Morrisville, VT 05661. Non-Responsive, DrPH, CIH performed the evaluation on October 17, 2012. The point of contact for the facility was SGT Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Morrisville Readiness Center was built in the 1950's. The readiness center is staffed by 4 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Morrisville Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Morrisville facility consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed on the interior of the building. Two areas of peeling, flaking and chipping paint were observed on the exterior of the building. Bulk samples for lead-paint analysis were collected into centrifuge tubes and analyzed by AMA Analytical Laboratory. Paint is defined as lead-based if it contains more than 0.5 percent lead by atomic absorption spectrophotometry (AAS) analysis following the analytical method ASTM D3335-85A. One of the two paint chip samples was above the 0.5% definition of lead-based paint. Table 1 presents the results of paint chip sample analysis. Certificates of Analysis are included in Appendix B.

Table 1 – Results of Lead Paint Chip Sampling for VT ARNG Morrisville Readiness Center on October 17, 2012

Sample Number	Sample Description	Sample Location	Comments	Lead Content (percent)
MRC-20	White metal or transite ceiling	Front Porch ceiling by light fixture closest to Office 3 location	An area approximately 6 ft by 40 ft was peeling, flaking and chipping. Paint chips were falling to the ground.	**1.7**
MRC-21	White metal exterior door	Boiler Room Door Upper hinge side	Three distinct layers of paint were visible. Not all three layers were equally/representatively sampled. The outermost layer was peeling and flaking.	0.093

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected by wiping a Ghost Wipe over a measured area. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the ledge of the bay door in the Drill Hall (270 µg/ft^2). Results are given in Table 2 and certificates of analysis are included in Appendix B.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Morrisville Readiness Center

Note that limited supplies were provided by the ARNG IH Region North for the group of sites surveyed by the inspector. The number and location of samples was limited and is based upon professional judgment.

Table 2 – Results of Dust Wipe Sampling for VT ARNG Morrisville Readiness Center on October 17, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft²)*
MRC-1	Former Firing Range – End of range, 7' north of south, 12' west of east – floor	11" x 11"	74
MRC-2	Former Firing Range – Middle 7' south of north wall, 24' east of west wall – floor	10" x 11"	41
MRC-3	Former Firing Range – By door, 1' south of north wall, 8' east of west wall - floor	9" x 10.5"	58
MRC-4	Vault – 3' west of east wall, 1.5' south of north wall - Floor	12" x 11"	61
MRC-5	Drill Hall – 18' north of south wall, 15' west of east wall – Floor	14" x 13"	**270**
MRC-6	Drill Hall – Top of locker #81. 25' west of east wall, 2' south of north wall.	3" x 36"	<16
MRC-7	Drill Hall – Middle of room - Floor	11" x 11.5"	22
MRC-8	Drill Hall – Top of POL Locker	9" x 12.5"	140
MRC-9	Kitchen – Window Sill	(9" x 7") + (2.5" x 2.5")	27
MRC-10	Kitchen – 5' east of west wall, 7' north of south wall – Floor	12" x 12"	<12
MRC-11	Scullery Kitchen – Bottom shelf of pot storage	10" x 10"	<17

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). A drawing from the Asbestos Survey Report by AIM Group performed on December 1, 1997 identified the floor tile as asbestos-containing material. Three broken floor tiles were noted between Office 1 and Office 2. The tile is not crumbling into small pieces. No other damaged suspect ACM was observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or visible mold growth was observed.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall. One area of concern was observed in the Drill Hall. Oily rags were stored in plastic bags in the flammable materials storage cabinet that also contained propane cylinders. The POL storage cabinet doors do not close properly. This is a fire and life safety hazard as the cabinets are in the route of egress to the supply room and arms vault.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas: the platoon room, Office 1, the gym, the janitor's closet, FSC Office, maintenance, the kitchen and the boiler room. The illumination measurements indoors ranged from 13.7 foot candles (fc) to 82.0 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in July 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 3. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 3 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 65.2 to 70.1º F and 34.4 to 52.7% Rh. Temperatures and relative humidity were just below lower end of the winter temperature range for thermal comfort in all but five of the locations monitored. The outdoor temperature and relative humidity was 46.5º F and 39.5% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 482 to 600 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 03.3 to 4.0 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

A diesel powered fork lift was parked inside the drill hall on the day of the survey. The use of the equipment indoors may contribute to unsafe carbon monoxide concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDSs were last updated in July of 2009. MSDSs for some new custodial products were required per OSHA 29 CFR 1910.1200.

7 Conclusions

The results of the evaluation indicated a few industrial hygiene concerns in the facility. Overall, the Morrisville Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for

reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

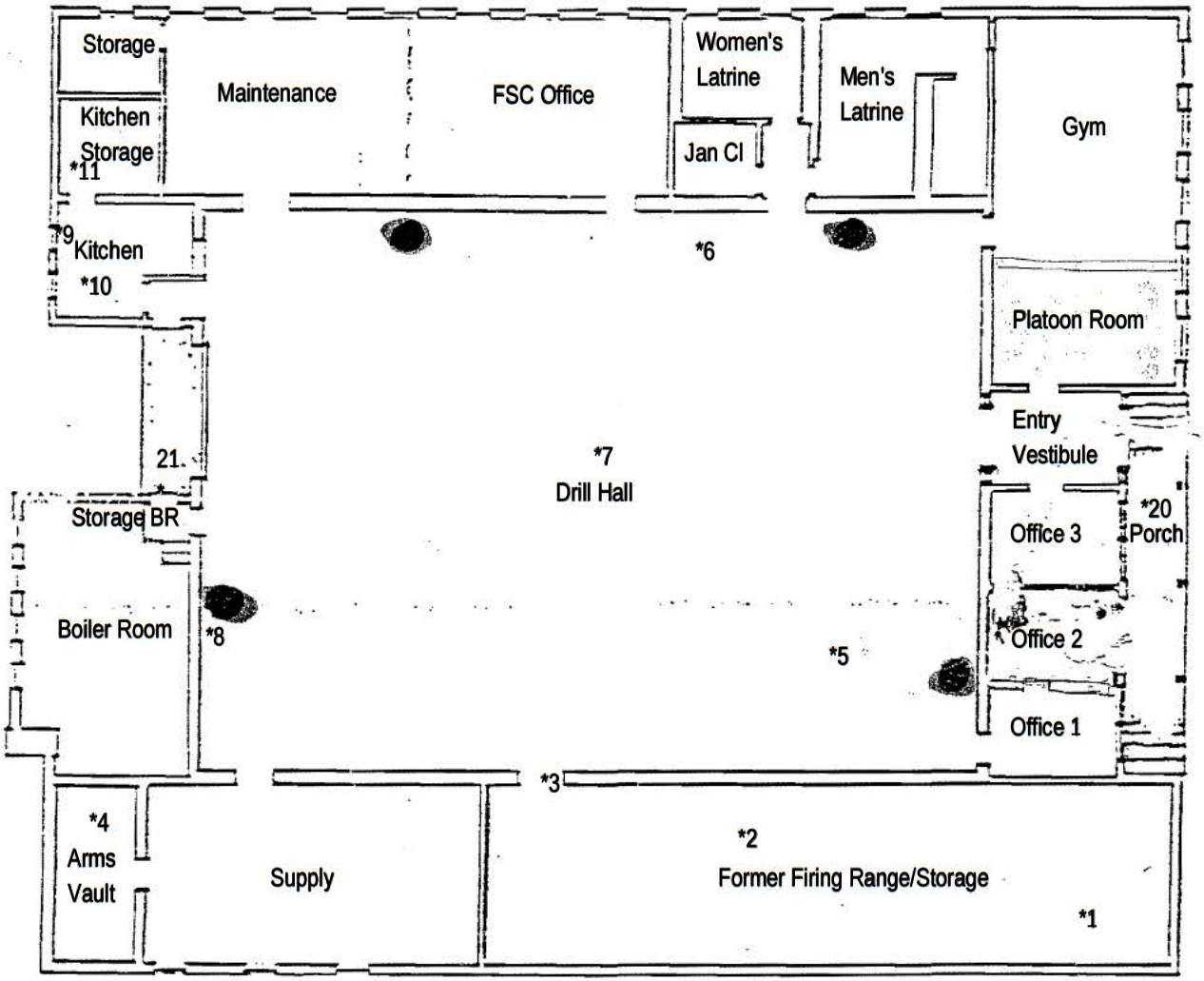
9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".

15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout

FIRE EVACUATION PLAN



*## - Lead Wipe or Paint Chip Sample Location

= AREA OCCUPATION AND ARROWS TO FOLLOW

= LOCATION OF FIRE EXTINGUISHERS

Sample Location Plan
Industrial Hygiene Survey
October 17, 2012

FLOOR PLAN	
MORRISVILLE ARMORY	
SCALE: 1" = 20'	6 NOV. 80

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	VT ARNG 3M IH Surveys	**Chain Of Custody:**	514301
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Morrisville RC	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	120685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	10/30/2012 **Report Date:** 11/2/2012

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
13008799	MCR-1	Flame	Wipe	****	0.840	14	ug/ft^2	62	74	ug/ft^2	
13008800	MCR-2	Flame	Wipe	****	0.764	16	ug/ft^2	31	41	ug/ft^2	
13008801	MCR-3	Flame	Wipe	****	0.656	18	ug/ft^2	38	58	ug/ft^2	
13008802	MCR-4	Flame	Wipe	****	0.917	13	ug/ft^2	56	61	ug/ft^2	
13008803	MCR-5	Flame	Wipe	****	1.264	9.5	ug/ft^2	340	270	ug/ft^2	
13008804	MCR-6	Flame	Wipe	****	0.750	16	ug/ft^2	<12	<16	ug/ft^2	
13008805	MCR-7	Flame	Wipe	****	0.879	14	ug/ft^2	20	22	ug/ft^2	
13008806	MCR-8	Flame	Wipe	****	0.781	15	ug/ft^2	110	140	ug/ft^2	
13008807	MCR-9	Flame	Wipe	****	0.481	25	ug/ft^2	13	27	ug/ft^2	
13008808	MCR-10	Flame	Wipe	****	1.000	12	ug/ft^2	<12	<12	ug/ft^2	
13008809	MCR-11	Flame	Wipe	****	0.694	17	ug/ft^2	<12	<17	ug/ft^2	
13008810	MCR-20	Flame	Paint Chip	****	N/A	0.0085	%Pb		1.7	%Pb	
13008811	MCR-21	Flame	Paint Chip	****	N/A	0.0087	%Pb		0.093	%Pb	

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	Havre de Grace, Maryland 21078	**Job Number:**	120685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	10/30/2012 **Report Date:** 11/2/2012

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.

Analyst: 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) 514301

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: VTARNG 3M IH Surveys
2. Job Location: Morrisville RC
3. Job #: 120685 P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted] @ phone #
5. Submitted by: [redacted] Signature

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
☐ Immediate Date Due:	☐ Immediate ☐ 3 Day ☐ Results Required By Noon	☒ Include COC/Field Data Sheets with Report
☐ 24 Hours Time Due:	☐ Next Day ☒ 5 Day +	☒ Email: [redacted] @ariaenviro.com
Comments:	☐ 2 Day Date Due: 10/30/12	☐ Fax: [redacted] @us.army.mil
		☐ Verbal: [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)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ☒ Pb Paint Chip 2 (QTY)
- ☒ *Pb Dust Wipe (wipe type Ghost) 11 (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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
MRC-1 Dup	MRC-11						✓			✓	✓				
MRC-20 & MRC-21							✓			✓					
SEE ATTACHED FIELD DATA SHEETS															

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 / 24 / 12 @ Via: By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Comments: ____

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10-17-12

Job Site: Morrisville RC

Project No.: J12-685

Inspector: Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
MRC-1	Pb Wipe	Former Range Floor End 7' N of S, 12' W of E	11" x 11"
MRC-2	"	Former Range Floor middle 7' S of N 24' E of W	10" x 12"
MRC-3		Former Range Floor By door 1' S of N 8' E of W	9" x 10.5"
MRC-4		Vault Floor 3' W of E, 1½' S of N	12" x 11"
MRC-5		Assembly Hall Floor 18' N of S Wall, 15' W of E Wall	14" x 13"
MRC-6		Assembly Hall Top of Locker #81 25' W of E wall 2' S of N	3" x 36"
MRC-7		Assembly Hall Floor middle of room	11" x 11.5"
MRC-8		Assembly Hall top of Pa Locker	9" x 12.5"
MRC-9		Kitchen Window Sill	(9" x 7") + (2.5" x 2.5")
MRC-10		Kitchen Floor 5' E of W, 7' N of S	12" x 12"
MRC-11		Kitchen - Scullery Bottom shelf of Pot storage	10" x 10"

Aria Environmental, Inc

ASBESTOS BULK AND PAINT CHIP SAMPLING SURVEY SHEET

Inspector: Non-Responsive

License/Accreditation No.:

Witnessed By:

Date Collected: 10-17-12

Job Site: Morrisville RC

Project No.: J12-685

Sample No.	Type of Material Sampled	Floor	Functional Area	Sample Location	Comments
MRC-20	White metal or transite Ceiling	1	Front Porch	Ceiling ~~on~~ by light fixture closest to Office 3 location	40'x6' PFC
MRC-21	White metal exterior door	1	Boiler Room Door	On door upper hinge side	PFC - 3 distmct layers

BEST AVAILABLE COPY

Appendix C
Photo Documentation

VT Morrisville RC

Photo 1: Morrisville RC view from Farr Avenue.

Photo 2: Morrisville RC Commemorative Plaque from 1958.

Photo 3: Morrisville RC rear façade.

Photo 4: Morrisville RC rear façade at boiler room.

VT Morrisville RC

Photo 5: Drill Hall.

Photo 6: Diesel powered fork lift in drill hall.

Photo 7: POL and flammable cabinets in Drill Hall. Note doors to POL storage cabinet do not function properly.

Photo 8: View inside POL storage cabinet.

VT Morrisville RC

Photo 9: Oily rags in plastic bag inside flammable materials cabinet.

Photo 10: View inside part of the flammable material storage cabinet.

Photo 11: View inside cold storage.

Photo 12: View of fueling tent.

VT Morrisville RC

Photo 13: View of full fuel cans inside fueling tent.

Photo 14: View of peeling, flaking and chipping lead-based paint on porch ceiling.

Photo 15: View of damaged paint on metal exterior door. The paint was tested and is not lead-based.

Photo 16: View of broken asbestos-containing floor tile typical of damage in the office areas.

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Morrisville	IAQ								Light		
Date	10/17/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Morrisville RC			Serial Number		7575x1228004						Serial Number		K040084EL
Weather Conditions	Sunny			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Former Range	Storage	var	0809	65.4	L	52.7		530		3.7		13.7		10
Vault	Weapon Storage	var	0826	66.5	L	48.9		482		3.9		60.6		10
Storage (BR)	Storage	var	0832	65.2	L	35.2		514		3.7		20.0		10
Platoon Room	Platoon Room	var	0837	66.4	L	42.1		538		4.0		24.9	X	30-50
Vestibule	Vestibule	var	0838	66.1	L	41.0		566		3.7		20.8		10
Office 3	Office	1	0839	66.9	L	41.9		563		3.5		39.7		30-50
Office 2	Office	1	0840	67.8	L	42.6		600		3.3		57.3		30-50
Office 1	Office	1	0840	68.3	L	42.0		633		3.3		26.5	X	30-50
Drill Hall	Drill Hall	var	0841	67.5	L	39.1		536		3.7		82.0		30-50
Gym	Gym	var	0842	66.8	L	40.2		566		3.8		24.9	X	30
Women's Latrine	Latrine	var	0843	67.0	L	36.4		509		3.6		36.6		5
Janitor's Closet	Storage	var	0844	68.4	L	43.6		555		3.3		23.1	X	30
Men's Latrine	Latrine	var	0845	68.6		52.1		593		3.5		38.3		5
FSC Office	Office	5	0846	70.1		40.0		492		3.6		24.8	X	30-50
Maintenance	Office	var	0847	69.0		39.5		502		3.8		20.2	X	30-50
Kitchen	Storage	var	0848	68.5		34.4		533		3.6		15.3		5
Kitchen	Kitchen	var	0849	68.7		36.8		543		3.6		36.7	X	50
Boiler Room	Boiler Room	var	0850	68.2	L	35.0		525		3.5		21.5	X	30
Supply	Storage	1	0851	67.8	L	41.5		550		3.4		32.7		30
Outdoors	Outdoors	0	0855	46.5		39.5		466		4.1		3.1 K		N/A

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
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Shaw® Shaw Environmental, Inc.

National Guard Armory
Rutland Readiness Center – Rutland, Vermont

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 May 2004

National Guard Armory
Rutland Readiness Center – Rutland, Vermont

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 May 2004

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 Rutland Readiness Center in Rutland, Vermont Non-Responsive performed the evaluation on 5 August 2003 and 10 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 Range
- 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
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources

- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at four locations (assembly hall and basement kitchen) in the armory. It is recommended that these surfaces and the areas immediately around these surfaces be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor and basement kitchen should be thoroughly cleaned.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) at several locations in the armory. Areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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. It should be noted that the Vermont based STARBASE youth program leases a portion of the Rutland armory. This portion is immediately between the armory lobby and the drill hall. Both military personnel and STARBASE personnel/youth program activities utilize the drill hall/assembly room, therefore, thoroughly cleaning these areas is strongly recommended.
- Peeling paint was observed in the basement of the armory, and bulk sampling results at four locations (boiler room walls, man's latrine, and shower room ceiling and wall) revealed this paint to be a lead-based. Anyone who may perform repair and/or maintenance activities on these surfaces should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be taken.
- Materials (floor tiles in the kitchen) 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 was likely from roof leaks, poor ventilation, or building foundation breach/high water table. The source of the water damage should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Visible mold was observed on the engineering unit office wall and boiler room walls at the armory. The areas where the mold is located should be thoroughly cleaned with

0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.

- Indoor air quality measurements revealed that the humidity and temperature measurements at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically on the second floor and in the men's shower room where there is a minimal fresh air supply. A fan can be used for both cooling purposes and to circulate air in the men's shower room.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in most areas; therefore consideration should be given to providing more lighting in these areas. 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.
- There was not a converted firing range at the facility; however, there was an inactive indoor firing range. For informational purposes, wipe samples were taken for lead at various locations in or near the range. As expected, the results revealed lead at extremely high concentrations. This inactive firing range should not be used for any purposes, except as a firing range (if approved as a fully operating range), until the lead levels are reduced below the recommended level. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Rutland Readiness Center in Rutland, Vermont. Non-Responsive performed the evaluation on 5 August 2003 and 10 October 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 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 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/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 hall. If there were any positive results from the drill floor/assembly hall, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at three locations. Three samples collected in the assembly hall (soda machine top surface, heater vent surface, and floor outside the firing range) had lead concentrations of 310, 290, and 30,000 $\mu g/ft^2$, respectfully. The sample collected from the heater unit flap surface in the basement kitchen had a lead concentration of 1100 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 µg/ft^2 at several locations in the basement, first floor, and the assembly hall. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas with lead concentrations above 40 µg/ft^2 that will be accessible to children should be 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.

It should be noted that the Vermont based STARBASE youth program leases a portion of the Rutland armory. This portion is immediately between the armory lobby and the drill hall. Both military personnel and STARBASE personnel/youth program activities utilize the drill hall/assembly room, therefore, thoroughly cleaning these areas is strongly recommended.

2.1.2 Air Sampling for Lead

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 actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory in six locations in the basement (hallway outside of Firing Range, engineering unit classroom wall, boiler room walls, men's latrine wall - 1st stall, men's shower room ceiling, and men's shower room wall. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or 0.5 percent by weight. Bulk sampling results revealed lead at four of the six locations were below 0.5 percent by weight. The samples collected from the boiler room walls (approximately 2600 square feet), men's latrine wall (1st stall) (approximately 12 square feet) and men's shower room ceiling and wall (approximately 120 square feet) revealed lead

concentrations of 0.58, 9.7, 5.3, and 0.97 percent by weight, respectively. The paint was in poor condition. The results of the sampling are provided in Table 3.

Anyone who may perform repair and/or maintenance activities on surfaces coated with lead-based paint should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be 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 were floor tiles in the kitchen (approximately 1641 square feet). The condition of the floor tiles materials was considered good since there was no damage to tiles.

An operation 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. Water damage and visible mold were observed at the armory. Water damage was observed on the ceilings in the drill hall/assembly room, second floor foyer/common area/stairwell, and first floor office adjacent to handicap bathroom. In addition, the water damage observed on the ceiling in the man's latrine, walls in the hallway outside of firing range, engineering unit office, boiler room, men's latrine, and shower room were all accompanied by peeling paint. Visible mold was observed on the engineering unit office wall and boiler room walls.

The source of the water damage was likely from roof leaks concerning the ceiling water damage, poor ventilation in the men's shower room, and building foundation breach/high water table concerning the damage observed in the basement, . The source of the water damage should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.

The areas where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.

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

2.3.2 Indoor Air Quality

Interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the men's shower room, where there is a minimal fresh air supply, and the offices on the second floor. In addition, measurements for humidity revealed that levels exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Also, 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. The measurements for temperature on the second floor exceeded the acceptable range. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, a fan can be used for cooling purposes and to circulate air in the men's shower room.

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 HAZCOM and personal protective equipment (supply sergeant is required to wear safety boots) programs were applicable at the facility. The programs were evaluated and it was determined that the program 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 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. 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 most areas, including the gym, men's latrine, basement storage area, first floor office adjoining to SFC Rabtoy's office, first floor office adjacent to handicap bathroom, and six offices on the second floor.

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 firing range at the facility; however, there was an inactive indoor firing range. For informational purposes, wipe samples were taken for lead at various locations in or near the range. The results are provided in Table 6. As expected, the results revealed lead at extremely high concentrations. This inactive firing range should not be used for any purposes, except as a firing range (if approved as a fully operating range), until the lead levels are reduced 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). For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

2.9. HVAC System

There was a HVAC system located in the computer classroom. 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.

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, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, peeling lead-based paint, suspected asbestos-containing material, water damage, visible mold, indoor air quality, surface lead contamination in the firing range, 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
Rutland, Vermont
Dates of Sampling: 5 August 2003 and 10 October 2003

Sample Number	Location	Results, µg/ft²[a]
VTRUT217-1	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTRUT217-2	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTRUT217-3	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTRUT217-4	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTRUT217-5	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTRUT217-6	Field Blank	< 12 µg
VTRUT217-14	Basement – Classroom (mess hall) – table top	16
VTRUT217-15	Basement – Classroom (engineering unit office) – cabinet top	100
VTRUT217-16	Basement – Kitchen – heater unit flap surface	1100
VTRUT217-17	Basement – Break room – cabinet top surface	39
VTRUT217-18	Field Blank	< 0.3 µg
VTRUT217-19	Basement – Hallway – windowsill	14
VTRUT217-20	First Floor – Recruiting office – desktop	16
VTRUT217-21	First Floor – Lobby – glass case top surface	22
VTRUT217-22	First Floor – hallway to drill hall (Star base) – counter top surface	54
VTRUT217-23	First Floor – Office adjoining C. Rabtoy's office – desk shelf top surface	6.7
VTRUT217-24	Field Blank	< 0.3 µg
VTRUT217-25	Second Floor – Office – desktop surface	6.5
VTRUT217-26	Second Floor – Office – cabinet top surface	18
VTRUT284-1	Assembly Room – soda machine top surface (See Building Layout – Appendix B)	310
VTRUT284-2	Assembly Room – heater vent top surface (adjacent to stage) (See Building Layout – Appendix B)	290
VTRUT284-3	Assembly Room – heater vent top surface (adjacent to exit door) (See Building Layout – Appendix B)	58

[a] Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
Rutland, Vermont
Dates of Sampling: 5 August 2003 and 10 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTRUT284-4	Assembly Room - locker top surface (See Building Layout - Appendix B)	30
VTRUT284-5	Assembly Room – cabinet top surface (See Building Layout – Appendix B)	37
VTRUT284-6	Field Blank	< 0.3 µg
VTRUT284-7	HVAC Unit -Exhaust Ventilation Air Grille	39

[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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Rutland, Vermont
Date of Sampling: 5 August 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTRUT217-A1	Non-Responsive	0803-1053/170	2.471	420.05	< 0.002
VTRUT217-A2		0804-1052/168	2.458	412.99	< 0.002
VTRUT217-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
Rutland, Vermont
Date of Sampling: 5 August 2003

Sample Number	Location	Results, % By Weight
VTRUT217-B1	Basement - hallway outside of Firing Range	0.16
VTRUT217-B2	Basement – classroom (engineering unit office) wall	0.044
VTRUT217-B3	Basement - boiler room walls	0.58
VTRUT217-B4	Basement - men's latrine wall (1st stall)	9.7
VTRUT217-B5	Basement - men's shower room ceiling	5.3
VTRUT217-B6	Basement – men's shower room wall	0.87

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
Rutland, Vermont
Date of Sampling: 5 August 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
Outdoors	0	445	78.4	78.5
Basement-Classroom (mess hall)	1	718	67.4	75.6
1st Floor-foyer	2-3	405	61.9	78.4
2nd Floor-office (see diagram)	1	450	63.4	84.4

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

Rutland, Vermont

Date of Sampling: 5 August 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Basement-Classroom Engineering unit	106.4-116.5	70	Yes
Basement-Classroom (mess hall)	31.5-124.6	70	Some areas
Basement-hallway	0.7-75.3	7.5	Some areas
Basement-Gym	3.2-14.3	70	No
Basement-Men's Latrine	1.9-12.3	40	No
Basement-Kitchen	19.7-81.3	70	Some areas
Basement-Storage area	0.5-17.8	30	No
1st Floor-Office adjoining to SFC Non-Responsive office	27.4-51.3	70	No
1st Floor-Office adjacent to handicap bathroom	39.4-117.2	70	Some areas
1st Floor-Office opposite computer classroom	62.1-82.5	70	Some areas
1st Floor-Office adjacent to handicap bathroom	38.2-55.6	70	No
2nd Floor-Office	12.7-36.3	70	No
2nd Floor-Office	11.1-40.1	70	No
2nd Floor-Office	13.7-46.1	70	No
2nd Floor-Office	18.0-51.5	70	No
2nd Floor-Office	7.9-32.9	70	No
2nd Floor-Office	22.1-47.6	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 – Firing Range

National Guard Armory

Rutland, Vermont

Date of Sampling: 5 August 2003

Sample Number	Location	Results, $\mu g/ft^{2}$ [a]
VTRUT217-7	Floor Outside the Range drill hall	30000
VTRUT217-8	Floor	290000
VTRUT217-9	Stored Item (shelf)	23000
VTRUT217-10	Overhead Heaters	15000
VTRUT217-11	Light Fixture	3600
VTRUT217-12	Blank	< 12 µg
VTRUT217-13	Bullet Trap	1000000

[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.

Appendix A
HHIM Data Form(s)

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.
	Rutland Armory Vermont ARNG	Rutland

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative Operations / ADO

SURVEY DATE	EVALUATOR (Initials)
5 August 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive SFC

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-786-8800	Headquarters 1st. Battalion	4	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
3	15	0	0	0

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			EAR PLUGS			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-low	Uncontrolled Physical
7439-92-1	lead, inorganic dusts and fumes, Pb	2 moderate	Uncontrolled Respiratory
1332-21-4	Asbestos (other)	3-low	Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
please see attached military personnel list, none civilian employees. male and social security numbers are not available, in addition 5 members are in Korea during site visit, personnel including Matthew D Cole and Christopher B Sachno present at Guthrie as replacement personnel. The building is also occupied by STARBASE Youth Program, the staff is all military and leases and upkeeps a section of the building, however both military personnel and STARBASE personnel and Youth programs utilize the dodball. STARBASE full-time personnel include at least 2 employees as well the building has one civilian caretaker.					

SECTION 6. COMMENTS

No comments X See attached sheet for staff (personnel)

Survey was conducted by Michele Sexton. Building occupants include attached list of military personnel and others (see above). Military staff 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.

Rutland Armory

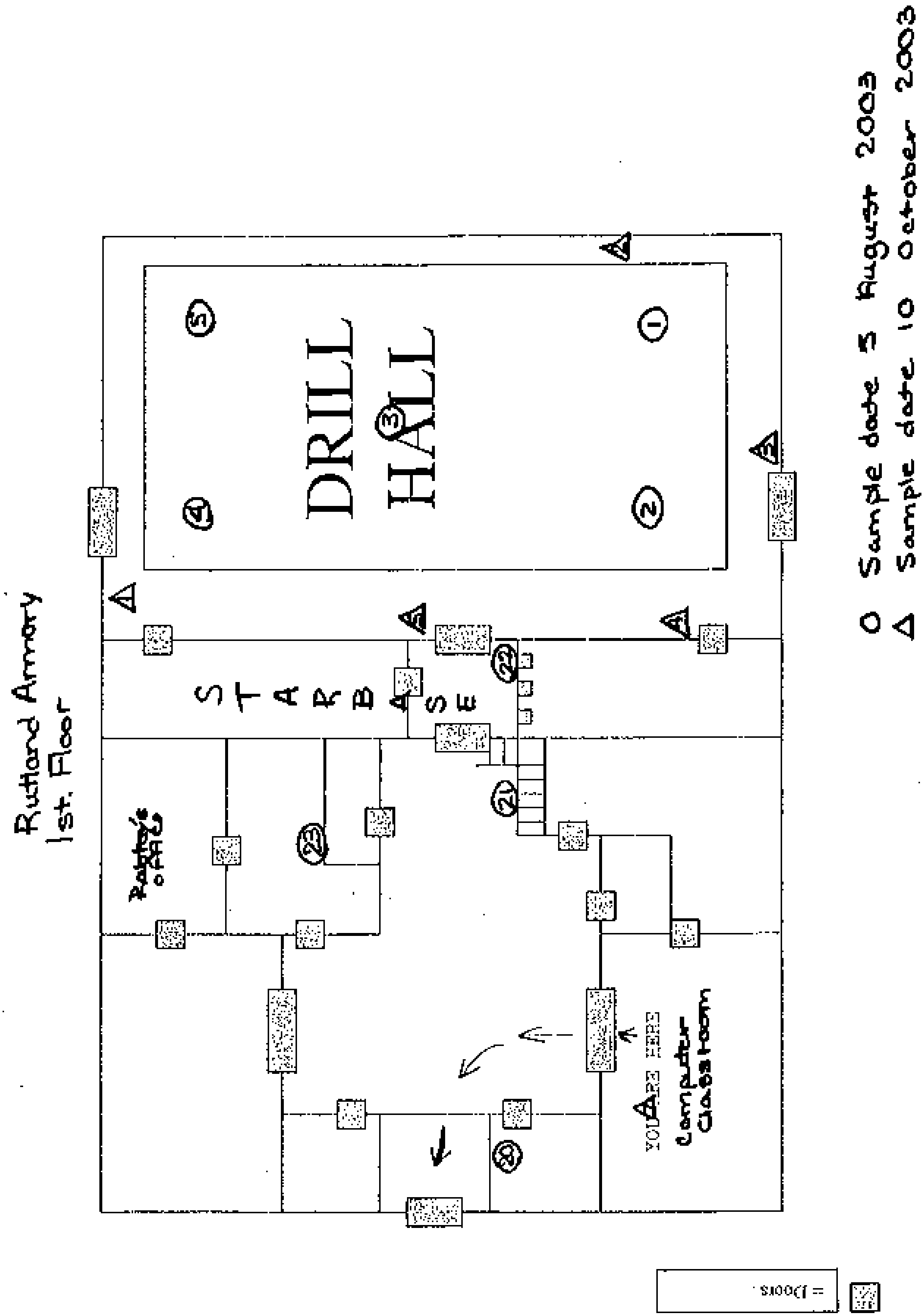
AGR Soldiers:

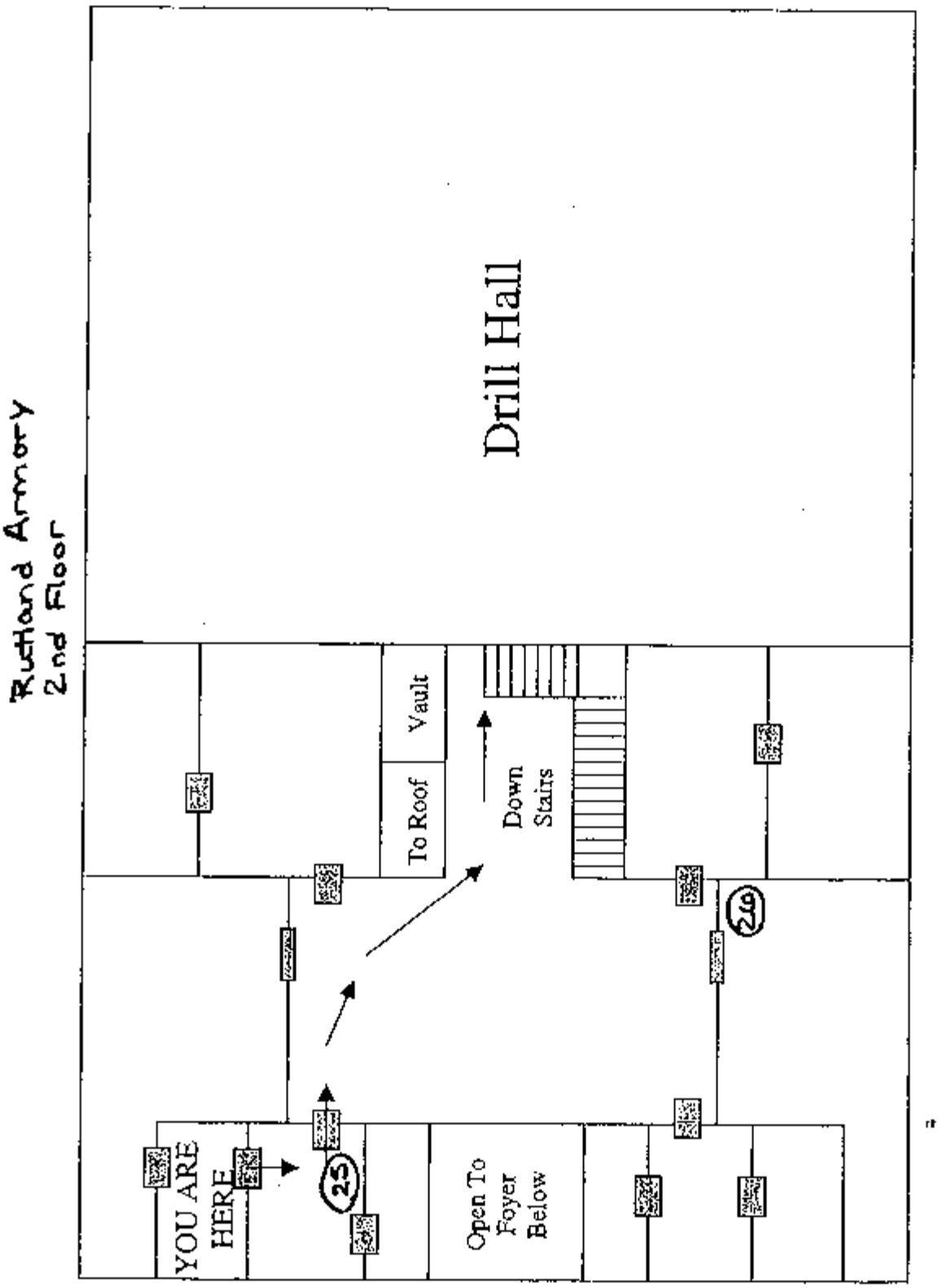
MAJ Non-Responsive
CPT
1LT
MSC
SFC
SFC
SFC
SSG
SSG
SGT

ADSW Soldiers (SFOR) Bosnia:

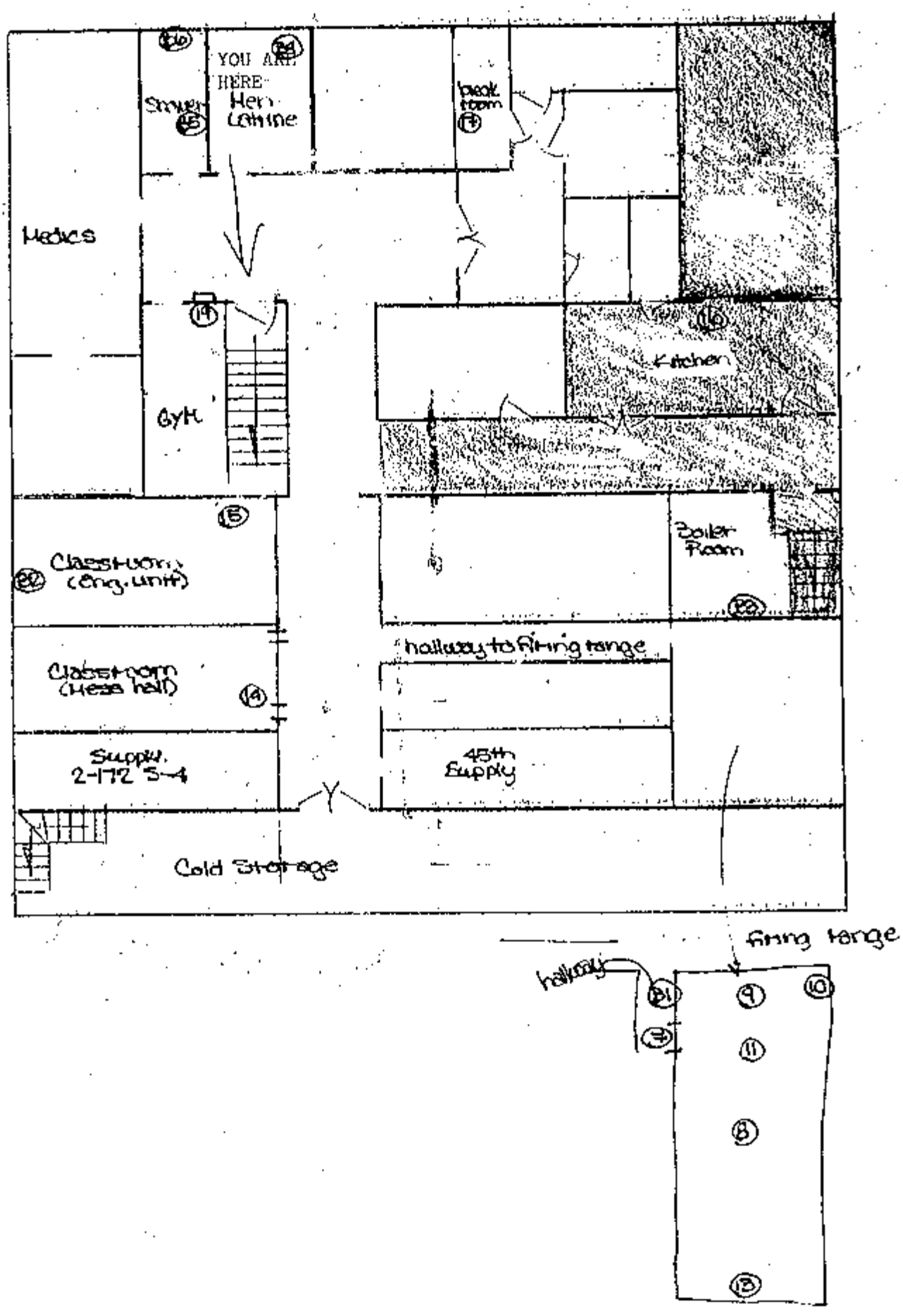
CPT Non-Responsive
1LT
SFC
SSG
SSG

Appendix B
Building Layout


Rutland Armory
1st. Floor
DRILL HALL
S T A R B A S E
Computer Classroom
YOU ARE HERE
○ Sample date 5 August 2003
△ Sample date 10 October 2003
= Doors



HHC, 2BCT, 172 AR — BASEMENT — NOT 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:**	VTRUT217	**Chain Of Custody:**	115915
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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
0362265	VTRUT217-1	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362266	VTRUT217-2	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362267	VTRUT217-3	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362268	VTRUT217-4	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362269	VTRUT217-5	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362270	VTRUT217-6	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362271	VTRUT217-7	Flame	Wipe	****	0.111	108.00	ug/ft²		30000	ug/ft²	
0362272	VTRUT217-8	Flame	Wipe	****	0.111	108.00	ug/ft²		290000	ug/ft²	
0362273	VTRUT217-9	Flame	Wipe	****	0.111	108.00	ug/ft²		23000	ug/ft²	
0362274	VTRUT217-10	Flame	Wipe	****	0.111	108.00	ug/ft²		15000	ug/ft²	
0362275	VTRUT217-11	Flame	Wipe	****	0.111	108.00	ug/ft²		3600	ug/ft²	
0362276	VTRUT217-12	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362277	VTRUT217-13	Flame	Wipe	****	0.111	108.00	ug/ft²		1000000	ug/ft²	

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Client:	National Guard Bureau	**Job Name:**	VTRUT217	**Chain Of Custody:**	115915
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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

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]

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Client:	National Guard Bureau	**Job Name:**	VTRUT217	**Chain Of Custody:**	118929
Address:	301-III Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/30/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-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 (ft^2)	Reporting Limit		Final Result		Comments
0404814	VTRUT217-14	Furnace	Wipe	****	0.111	2.70	ug/ft^2		16	ug/ft^2
0404815	VTRUT217-15	Furnace	Wipe	****	0.111	27.00	ug/ft^2		100	ug/ft^2
0404816	VTRUT217-16	Furnace	Wipe	****	0.111	135.01	ug/ft^2		1100	ug/ft^2
0404817	VTRUT217-17	Furnace	Wipe	****	0.111	5.40	ug/ft^2		39	ug/ft^2
0404818	VTRUT217-18	Furnace	Wipe Blank	****	N/A	0.30	ug	<	0.3	ug
0404819	VTRUT217-19	Furnace	Wipe	****	0.111	2.70	ug/ft^2		14	ug/ft^2
0404820	VTRUT217-20	Furnace	Wipe	****	0.111	2.70	ug/ft^2		16	ug/ft^2
0404821	VTRUT217-21	Furnace	Wipe	****	0.111	2.70	ug/ft^2		22	ug/ft^2
0404822	VTRUT217-22	Furnace	Wipe	****	0.111	6.75	ug/ft^2		54	ug/ft^2
0404823	VTRUT217-23	Furnace	Wipe	****	0.111	2.70	ug/ft^2		6.7	ug/ft^2
0404824	VTRUT217-24	Furnace	Wipe Blank	****	N/A	0.30	ug	<	0.3	ug
0404825	VTRUT217-25	Furnace	Wipe	****	0.111	2.70	ug/ft^2		6.5	ug/ft^2
0404826	VTRUT217-26	Furnace	Wipe	****	0.111	2.70	ug/ft^2		18	ug/ft^2

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NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTRUT217	**Chain Of Custody:**	118929
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/30/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-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

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] **Manager:** [redacted]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

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AIHA

Client:	National Guard Bureau	**Job Name:**	VTRUT284	**Chain Of Custody:**	118720
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted] Non-Resp
		P.O. Number:	0701	**Report Date:**	21-Oct-03

Attention: [redacted] Non-Resp

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
0402928	VTRUT284 -1	Furnace	Wipe	****	0.111	67.51	ug/ft²	310	ug/ft²	
0402929	VTRUT284 -2	Furnace	Wipe	****	0.111	67.51	ug/ft²	290	ug/ft²	
0402930	VTRUT284 -3	Furnace	Wipe	****	0.111	13.50	ug/ft²	58	ug/ft²	
0402931	VTRUT284 -4	Furnace	Wipe	****	0.111	5.40	ug/ft²	30	ug/ft²	
0402932	VTRUT284 -5	Furnace	Wipe	****	0.111	6.75	ug/ft²	37	ug/ft²	
0402933	VTRUT284 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0402934	VTRUT284 -7	Furnace	Wipe	****	0.111	6.75	ug/ft²	39	ug/ft²	

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] Non-Responsive

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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTBEN216-A1 through VTRUT217-A3
P.O. No.:	Not Available
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3834
DCL Sample ID No.:	03-23429 through 03-23442
Sample Receipt Date:	8/8/2003
Preparation Date:	08/11/03
Analysis Date:	08/11/03

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
VTBEN216-A1	03-23429	402.71	ND	<0.002
VTBEN216-A2	03-23430	404.73	ND	<0.002
VTBEN216-A3	03-23431	0	ND	-
VTWES216-A1	03-23437	294.35	ND	<0.003
VTWES216-A2	03-23438	0	ND	-
VTRUT217-A1	03-23440	420.05	ND	<0.002
VTRUT217-A2	03-23441	412.99	ND	<0.002
VTRUT217-A3	03-23442	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		100.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTBEN216-B1 through VTRUT217-B6
P.O. No.:	Not Available
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3834
DCL Sample ID No.:	03-23432 through 03-23448
Sample Receipt Date:	8/8/2003
Preparation Date:	8/8/2003
Analysis Date:	8/12/2003

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.

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Non-Responsive
Analyst

Non-Responsive
Reviewer

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11 SANTA YORMA COURT
NOVATO, CALIFORNIA 94945
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
VTBEN216-B1	03-23432	190000.	19.
VTBEN216-B2	03-23433	4000.	0.40
VTBEN216-B3	03-23434	4400.	0.44
VTBEN216-B4	03-23435	36000.	3.6
VTBEN216-B5	03-23436	2400.	0.24
VTWES216-B1	03-23439	35.	0.0035
VTRUT217-B1	03-23443	1600.	0.16
VTRUT217-B2	03-23444	440.	0.044
VTRUT217-B3	03-23445	5800.	0.58
VTRUT217-B4	03-23446	97000.	9.7
VTRUT217-B5	03-23447	53000.	5.3
VTRUT217-B6	03-23448	8700.	0.87
	Prep Blank	ND	
% Recovery	LCS	93.	
% Recovery	23303MS	98.	
% Recovery	23303MSD	96.	
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

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** **RUT**
Date: 8/5/2002

Sample 1

Sample Number: VTRUT217-A1
Pump: 647615

	Pre Flow Rate	**Post Flow Rate**
	2.51	2.446
	2.497	2.442
	2.493	2.442
	2.498	2.439
Average	**2.500**	**2.442**

Average Pre and Post **2.4709**

Time 1	8:03
Time 2	10:53
Total Time Sampled	**2:50**
Minutes Sampled	170.00

Volume **420.05 Liters**

Sample 2

Sample Number: VTRUT217-A2
Pump: 648339

	Pre Flow Rate	**Post Flow Rate**
	2.494	2.428
	2.509	2.418
	2.485	2.421
	2.483	2.428
Average	**2.493**	**2.424**

Average Pre and Post **2.4583**

Time 1	8:04
Time 2	10:52
Total Time Sampled	**2:48**
Minutes Sampled	168.00

Volume **412.99 Liters**

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory Location: Rutland - VTRUT217
Date: 8/5/03

Sample 1
Sample Number: VTRUT217-A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.510	2.446
	2.497	2.442
	2.493	2.442
	2.498	2.4439
Average	2.500	2.442

Average Pre and Post 2.471

Time 1 0808
Time 2 1053
Total Time Sampled 2:50
Minutes Sampled 170

Volume 420.05 Liters

Sample 2
Sample Number: VTRUT217-A2
Pump: 648329

	Pre Flow Rate	Post Flow Rate
	2.494	2.428
	2.509	2.418
	2.485	2.421
Average	2.482	2.428
	2.493	2.424

Average Pre and Post

Time 1 0804
Time 2 1052
Total Time Sampled 168
Minutes Sampled 2:48

Volume 412.99 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, Preventive 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.

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National Guard Armory
St. Albans Readiness Center – St. Albans, Vermont

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

22 March 2004

National Guard Armory
St. Albans Readiness Center – St. Albans, Vermont

Industrial Hygiene Evaluation

Prepared for:

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

Prepared by:
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22 March 2004

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. (Shaw) was contracted to perform an industrial hygiene evaluation for the St. Albans Readiness Center in St. Albans, Vermont. Non-Responsive performed the evaluation on 15 and 16 July 2003 and 9 October 2003. The point of contact at the readiness center was CPT 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 Range
- 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
- Water Damage
- Presence of Mold
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs

- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at two locations (top of locker #90 and stereo system top surface) in the assembly/drill hall and a shelf top in the kitchen. It is recommended that these surfaces and the areas immediately around these surfaces be thoroughly cleaned to reduce the lead level. In addition, any other dusty/dirty areas in the assembly area/drill floor and kitchen should be thoroughly cleaned.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall and kitchen. 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.
- 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.
- The housekeeping in the basement was considered average in the areas that are not used by the staff; these areas were cluttered and dusty. The housekeeping in these areas should be improved.
- Indoor air quality measurements revealed that the temperature at the armory exceeded the recommended levels. A fan could be used for cooling purposes and to circulate air.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in most areas; therefore consideration should be given to providing more lighting in these areas. 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.
- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at all of the locations sampled. These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work

in these areas without protective clothing until the areas have been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the St. Albans Readiness Center in St. Albans, Vermont. Non-Responsive performed the evaluation on 15 and 16 July 2003 and 9 October 2003. The point of contact at the readiness center was CPT 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 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 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/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 hall. If there were any positive results from the drill floor, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at three locations. Two samples collected in the assembly/drill hall (top of locker #90 and stereo system top surface) had lead concentrations of 200 and 490 $\mu g/ft^2$, respectfully. The sample obtained from the shelf top in the kitchen had a lead concentration of 360 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 µg/ft^2 in the assembly hall and the kitchen. 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 for Lead

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 actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Bulk sampling results revealed lead at a concentration of 0.18 percent by weight in the paint sample taken from the kitchen wall. 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. Materials suspected of containing asbestos were observed. The suspected asbestos-containing material was insulation in the boiler room (approximately 13 linear feet and 10 pipe elbows/joints). The condition of the boiler room insulation materials was considered average since there were some areas where previous asbestos samples were collected that were covered by tape.

An operation 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. The inspection did not reveal any water damage or visible mold.

2.2.4 Visual Inspection - Housekeeping

The housekeeping was determined to be good on the first and second floors. The housekeeping in the basement was considered average in the areas that are not used by the staff; these areas were cluttered and dusty. The housekeeping in these areas should be improved.

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 no indoor air quality concerns at the armory. However, measurements for temperature revealed that levels exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommendations. 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. A fan could be used for cooling purposes and to circulate 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 the HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 most areas, including the Supply Technician Office, BN Supply SGT Office, HHC Administrative Office, XO Office, Conference Room, second floor bathroom, CSM Office, Medical Office, and Medical Exam Room.

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 converted range. The space was divided into a locker room and classroom (construction of classroom occurring during the survey). The results are provided in Table 6. The results revealed lead, with associated concentrations, at the following locations:

- inside remaining ventilation ductwork at 66000 micrograms lead per square foot ($\mu g/ft^2$);
- stored item - - locker top surface at 540 $\mu g/ft^2$;
- floor in the bullet trap area at 28000 $\mu g/ft^2$.

The lead levels at these locations were above 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). These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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 lead-based paint, water damage, visible mold, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, housekeeping, indoor air quality, surface lead contamination in the converted firing range, 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
St. Albans, Vermont
Dates of Sampling: 15 and 16 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTSTA196-1	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTSTA196-2	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTSTA196-3	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTSTA196-4	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTSTA196-5	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTSTA196-6	Field Blank	< 12 µg
VTSTA196-7	1st Floor – Recruiting Retention Office – cabinet top	13
VTSTA196-8	1st Floor – BN Supply Sgt. Office – desktop	4.8
VTSTA196-9	2nd Floor – Conference Area – table top	3.8
VTSTA196-10	2nd Floor – XO Office – desktop	< 2.7
VTSTA196-11	2nd Floor – CSM Office – cabinet top	3.2
VTSTA196-12	Field Blank	6 µg
VTSTA197-13	Basement – Kitchen – shelf top (below radiator)	360
VTSTA197-14	Basement – Medic Exam Room – desktop	10
VTSTA283-1	Assembly Room – top of soda machine (See Building Layout – Appendix B)	160
VTSTA283-2	Assembly Room – top of locker #90 (See Building Layout – Appendix B)	200
VTSTA283-3	Assembly Room – top of locker #81 (See Building Layout – Appendix B)	130

[a] Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
St. Albans, Vermont
Dates of Sampling: 15 and 16 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTSTA283-4	Assembly Room - top of locker #141 (See Building Layout - Appendix B)	130
VTSTA283-5	Assembly Room – stereo system top surface (See Building Layout - Appendix B)	490
VTSTA283-6	Field Blank	0.37 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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
St. Albans, Vermont
Date of Sampling: 15 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTSTA196-A1	Non-Responsive	1513-1618/65	2.5415	165.20	<0.006
VTSTA196-A2		1519-1619/60	2.5290	151.74	<0.007
VTSTA196-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
St. Albans, Vermont
Date of Sampling: 16 July 2003

Sample Number	Location	Results, % By Weight
VTSTA197-B1	Kitchen wall	0.18

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
St. Albans, Vermont
Date of Sampling: 15 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor	1	401	49.1	81.5
2nd Floor	2	495	52.7	82.0
Basement	1	443	51.0	79.9
Outdoors	0	370	75.1	72.3

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

St. Albans, Vermont

Date of Sampling: 15 and 16 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
1st Floor – foyer	8.1-36.8	7.5	Yes
1st Floor – Recruiting Retention Office	19.1-75.4	70	Some Areas
1st Floor – Supply Technician Office	19.1-47.7	70	No
1st Floor - - BN Supply SGT Office	20.1-46.5	70	No
1st Floor HHC Administrative Office	11.1-52.1	70	No
2nd Floor - XO Office	8.1-56.8	70	No
2nd Floor - - Conference Room	19.3-68.3	70	No
2nd Floor S-3 Office	16.2-78.7	70	Some areas
Staircase between 1st and 2nd Floor	2.3-57.4	7.5	Some areas
2nd Floor - - bathroom	20.1-24.0	40	No
2nd Floor – BN CDR Office	8.3-78.5	70	Some areas
2nd Floor - CSM Office	12.1-45.2	70	No
Basement – Kitchen	27.6-94.2	70	Some areas
Basement Medical Office	9.2-43.2	70	No
Basement – Medical Exam Room	20.1-50.1	70	No
Basement – Classroom	51.3-179	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.

Table 6

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

St. Albans, Vermont

Date of Sampling: 16 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTSTA197-15	Inside Remaining Ventilation Ductwork	66000
VTSTA197-16	Stored Item - Locker Top	540
VTSTA197-17	Floor - Bullet Trap Area	28000

[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.

Appendix A
HHIM Data Form(s)

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

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

SECTION 1. DEMOGRAPHIC DATA

RLOC	INSTALLATION	BLDG/RM NO.
	St. Albans Armory Vermont ARNG	St. Albans

OCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative OP/ADO

URVEY DATE	EVALUATOR (Initials)
15 and 16 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive, CPT

ELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-524-4101	Headquarters / 1-172AR Battalion	4	8

IO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
0	10	2	0	0

SECTION 2. FACILITY DATA

AB 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			EAR PLUGS			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-low	D Uncontrolled Physical
7439-92-1	Lead inorganic dust and fumes, as Pb	2-moderate	C Uncontrolled Respiratory
1332-21-4	Asbestos (other)	2-moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive		C	M	Non-Responsive	MIL
			M		
			M		
			M		
			M		
			M		
			M		
			M		
			M		

SECTION 6. COMMENTS

___No comments ✓See attached sheet

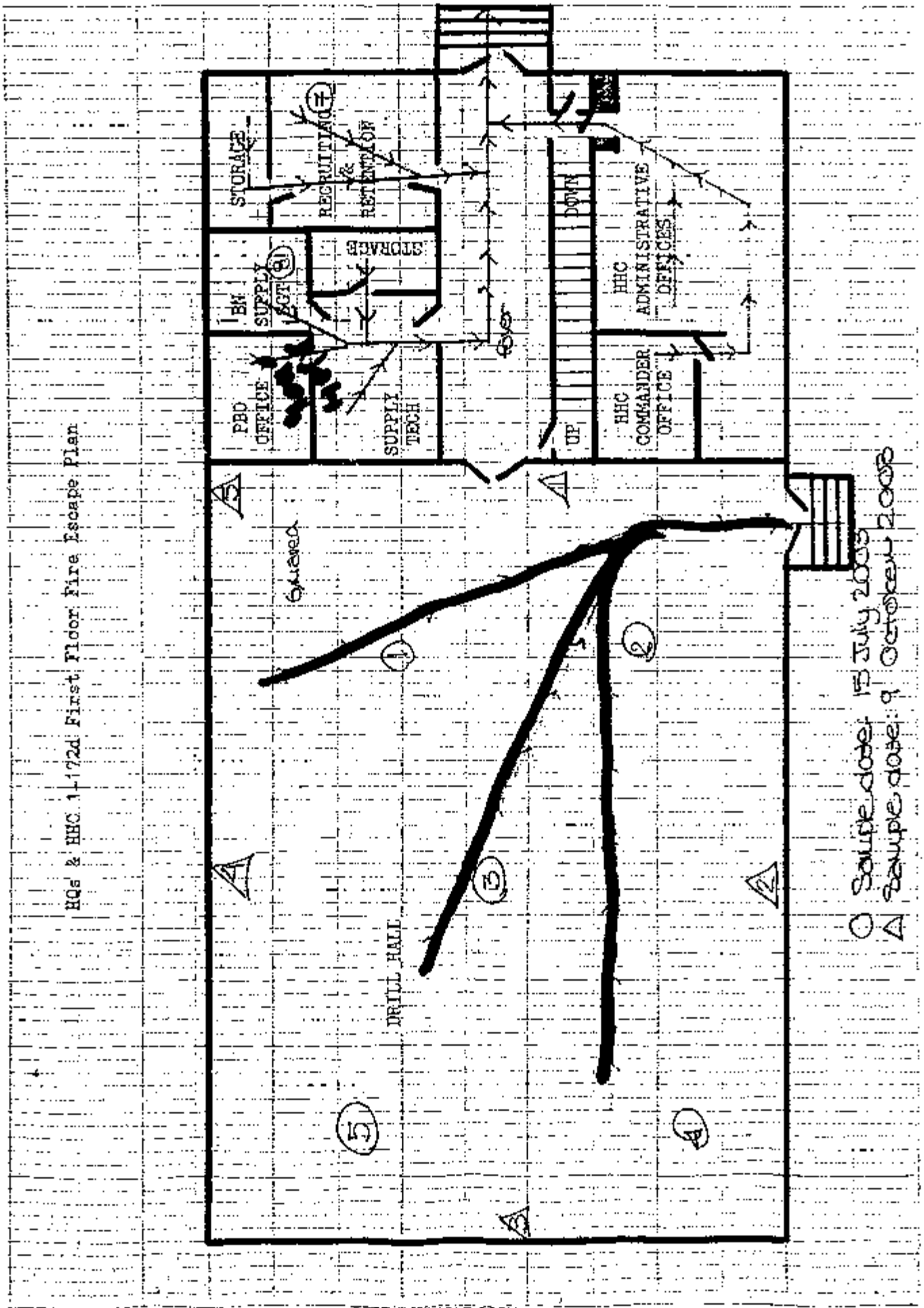
Survey was conducted by Michele Senan: Building contains 10 full-time military staff. The employees perform mainly administrative functions. Contractors were on site (2) two, constructing the ventilation system in the classroom in basement.

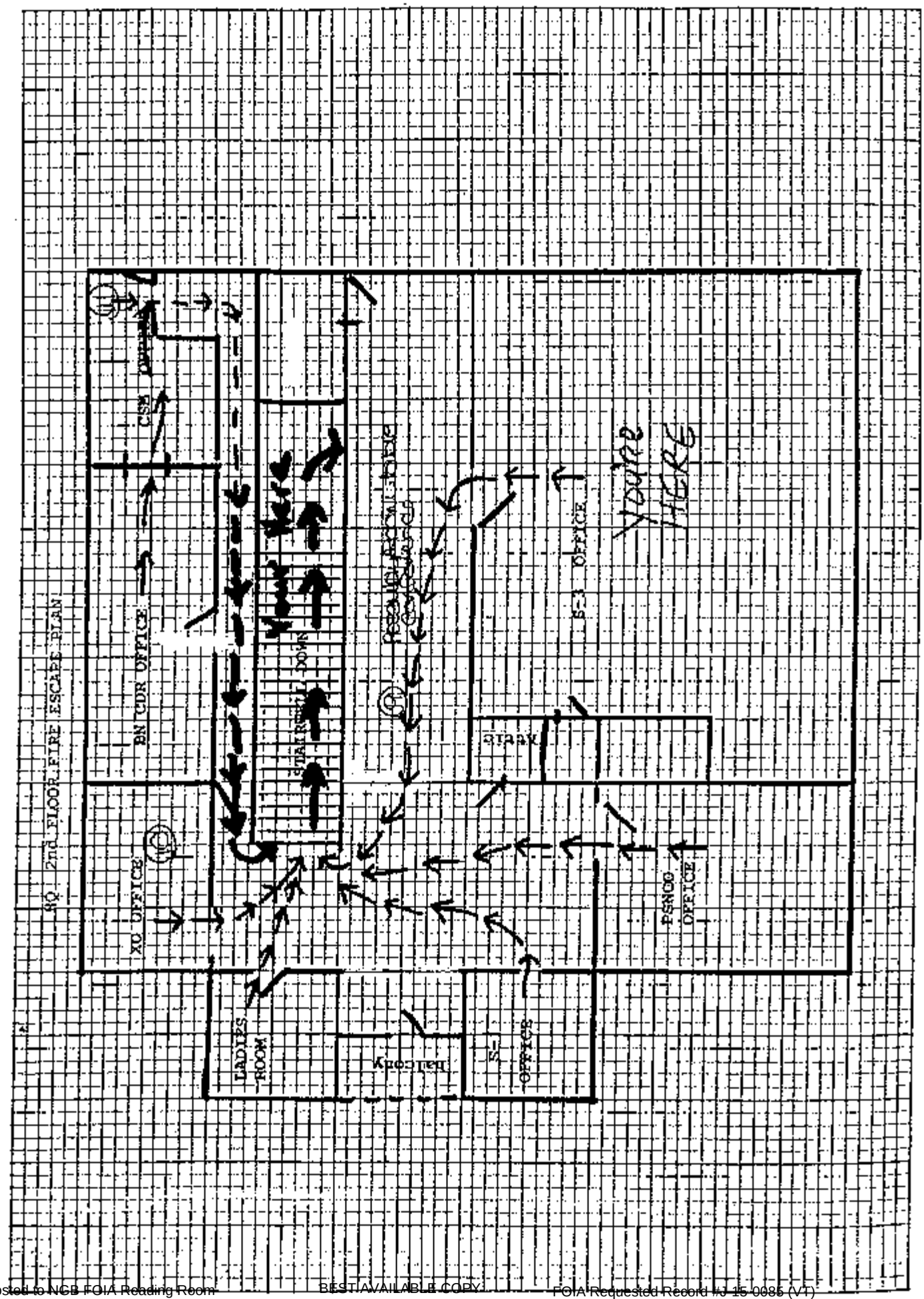
PRIVACY ACT STATEMENT

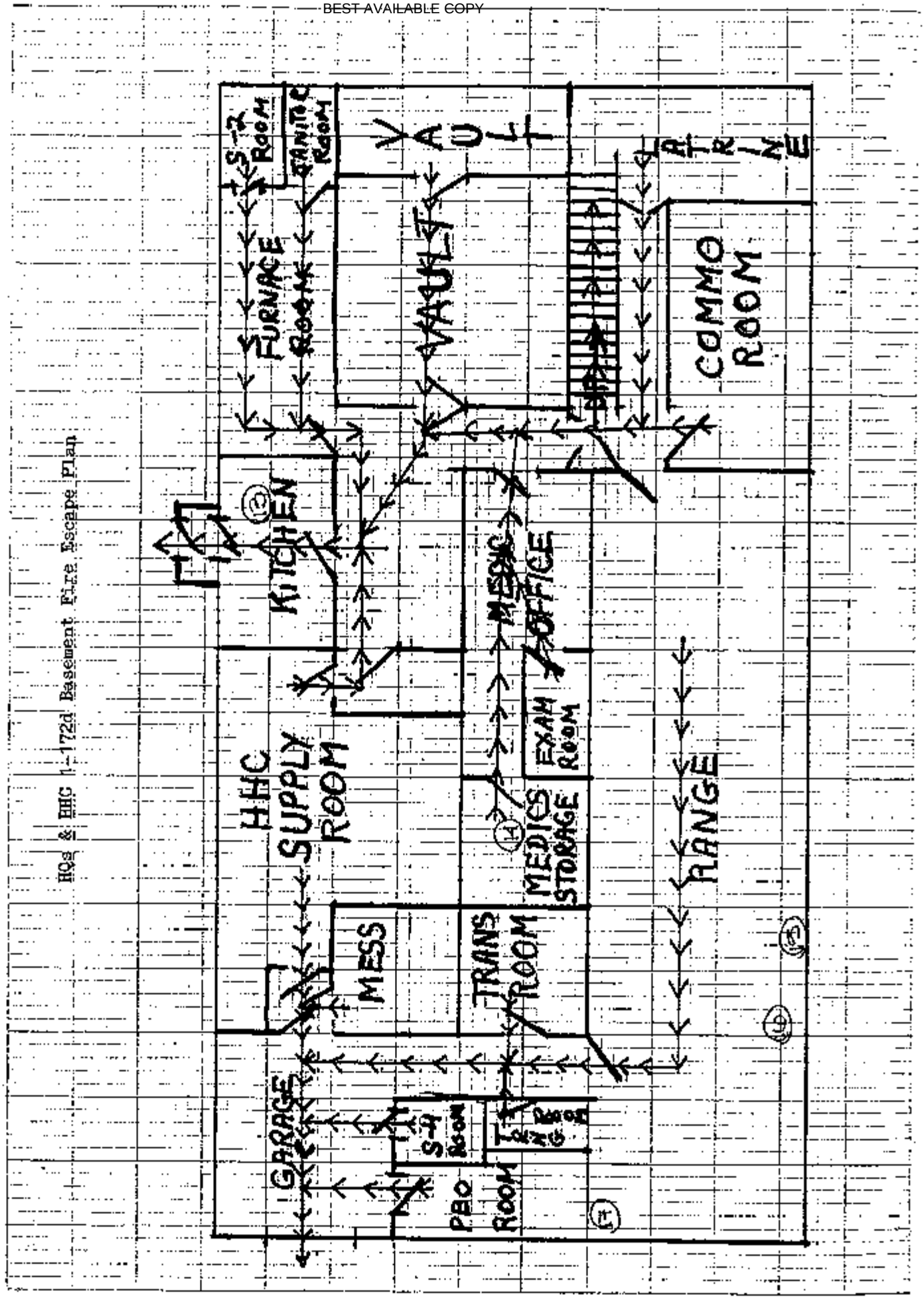
Title 5 US Code, Section 301; Executive Order 9397 authorizes the use of your Social Security Number as an identification number. The purpose of this information is to identify and monitor data relating each DA civilian and military employee exposed to a hazardous workplace or operation. The use of this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

Appendix B
Building Layout







Appendix C
Sampling Sheets and Laboratory Analyses

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

NVLAP
NY ELAP
AIHA

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	VTSTA196/197	**Chain Of Custody:**	115810
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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
0359492	VTSTA196-1	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359493	VTSTA196-2	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359494	VTSTA196-3	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359495	VTSTA196-4	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359496	VTSTA196-5	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359497	VTSTA196-6	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0359498	VTSTA197-15	Flame	Wipe	****	0.111	108.00	ug/ft²		66000	ug/ft²	
0359499	VTSTA197-16	Flame	Wipe	****	0.111	108.00	ug/ft²		540	ug/ft²	
0359500	VTSTA197-17	Flame	Wipe	****	0.111	108.00	ug/ft²		28000	ug/ft²	

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]

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTSTA283	**Chain Of Custody:**	118717
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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 (ft^2)	Reporting Limit		Final Result		Comments
0402910	VTSTA283 -1	Furnace	Wipe	****	0.111	67.51	ug/ft^2	160	ug/ft^2	
0402911	VTSTA283 -2	Furnace	Wipe	****	0.111	67.51	ug/ft^2	200	ug/ft^2	
0402912	VTSTA283 -3	Furnace	Wipe	****	0.111	67.51	ug/ft^2	130	ug/ft^2	
0402913	VTSTA283 -4	Furnace	Wipe	****	0.111	67.51	ug/ft^2	130	ug/ft^2	
0402914	VTSTA283 -5	Furnace	Wipe	****	0.111	67.51	ug/ft^2	490	ug/ft^2	
0402915	VTSTA283 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.37	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

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTSTA196/VTSTA197	**Chain Of Custody:**	118931
Address:	301-lH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/30/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-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
0404833	VTSTA196-7	Furnace	Wipe	****	0.111	2.70	ug/ft²	13	ug/ft²	
0404834	VTSTA196-8	Furnace	Wipe	****	0.111	2.70	ug/ft²	4.8	ug/ft²	
0404835	VTSTA196-9	Furnace	Wipe	****	0.111	2.70	ug/ft²	3.8	ug/ft²	
0404836	VTSTA196-10	Furnace	Wipe	****	0.111	2.70	ug/ft²	< 2.7	ug/ft²	
0404837	VTSTA196-11	Furnace	Wipe	****	0.111	2.70	ug/ft²	3.2	ug/ft²	
0404838	VTSTA196-12	Furnace	Wipe Blank	****	N/A	1.50	ug	6	ug	
0404839	VTSTA197-13	Furnace	Wipe	****	0.111	67.51	ug/ft²	360	ug/ft²	
0404840	VTSTA197-14	Furnace	Wipe	****	0.111	2.70	ug/ft²	10	ug/ft²	

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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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

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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
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, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	Lead
Client Sample No.:	VTCAM205-B1 through VTMCR203-B2
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22312 through 03-22339
Sample Receipt Date:	07/28/2003
Preparation Date:	07/29/2003
Analysis Date:	07/31/2003

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
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
VTCAM205-B1	03-22312	160.	0.016
VTWIN202-B1	03-22315	11000.	1.1
VTENO196-B1	03-22318	96000.	9.6
VTSTA197-B1	03-22327	1800.	0.18
VTWAT203-B1	03-22330	40.	0.0040
VTWAT203-B2	03-22331	57.	0.0057
VTMOR203-B1	03-22338	3900.	0.39
VTMOR203-B2	03-22339	11000.	1.1
	Prep Blank	ND	
% Recovery	LCS	87.	
% Recovery	03-22327 MS	* 0.	
% Recovery	03-22327 MSD	* 4.	
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.
* Low recovery due to non-homogeneous sample matrix.

Non-Responsive [redacted]

Christopher Gibson
Analyst

Non-Responsive [redacted]

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** **STA**
Date: 196

Sample 1

Sample Number: VTSTA196-A1

Pump:	647615	
	Pre Flow Rate	**Post Flow Rate**
	2.558	2.527
	2.556	2.521
	2.562	2.52
	2.57	2.518
Average	**2.562**	**2.522**

Average Pre and Post **2.5415**

Time 1	15:13
Time 2	16:18
Total Time Sampled	**1:05**
Minutes Sampled	65.00

Volume **165.20 Litere**

Sample 2

Sample Number: VTSTA196-A2

Pump:	648339	
	Pre Flow Rate	**Post Flow Rate**
	2.542	2.514
	2.539	2.518
	2.535	2.523
	2.537	2.524
Average	**2.538**	**2.520**

Average Pre and Post **2.5290**

Time 1	15:19
Time 2	16:19
Total Time Sampled	**1:00**
Minutes Sampled	60.00

Volume **151.74 Litere**

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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

St. Albans Readiness Center
18 Fairfield Street
St. Albans, VT 05478

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 24, 2011

AEI Project #: J11-601 4L VT St. Albans RC

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Non-Responsive, **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) St. Albans Readiness Center located at 18 Fairfield Street, St. Albans, VT 05478. Non-Responsive, CIH, CSP performed the evaluation on October 24, 2011. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the boiler room and on the 2nd floor in a hallway on a painted plaster patch. Bulk paint chip samples were found to contain 0.28% lead by weight in the Boiler Room and 4.8% lead by weight in the 2nd Floor Hallway. The second floor hallway paint chip sample would be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5% by weight). Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for a sample collected on the gray painted window sill in the Drill Hall (11,000 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged drywall and joint compound was observed on the boiler room ceiling; a crumbling plaster patch was observed in the 2nd Floor hallway; damaged plaster was observed in two offices on the 1st floor (S-4 and Training NCO offices); and damaged green linoleum with black mastic was observed in the Training NCO office. Samples of each damaged material were submitted for asbestos analysis. The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The damaged drywall and joint compound in the boiler room and the mastic under the green linoleum in the Training NCO Office contained 2% Chrysotile asbestos. No asbestos was detected in the other samples.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 2.5 foot candles (fc) to 138 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 59.0° F and 42.1% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new custodial products are required per OSHA 29 CFR 1910.1200. **RAC 4**

Overall, the St. Albans Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) St. Albans Readiness Center located at 18 Fairfield Street, St. Albans, VT 05478. Non-Responsive, CIH, CSP performed the evaluation on October 24, 2011. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

Construction of the St. Albans Readiness Center was built in 1914. The readiness center is staffed by 14 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the St. Albans Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the St. Albans facility consist exclusively of supply and administrative duties. No other maintenance of vehicles or other physical tasks are performed at the facility. A small garage exists in the facility basement but it is only used for storage. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the boiler room and on a plaster patch in the 2nd Floor hallway. Paint chip samples were submitted to AMA Analytical Services, Inc. of Lanham, MD for lead analysis. The samples were found to contain 0.28% lead by weight in the Boiler Room and 4.8% lead by weight in the 2nd Floor Hallway. The second floor hallway paint chip sample would be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5% by weight). Certificates of analysis are included in Appendix B

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the gray painted window sill in the Drill Hall (11,000 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG
St. Albans Readiness Center on October 24, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
StA – 01	Drill Hall – floor	<110
StA – 02	Drill Hall – window sill	**11,000**
StA – 03	Drill Hall – vending machine	<110
StA – 04	Drill Hall – storage locker	<110
StA – 05	Drill Hall – floor	<110
StA – 06	2nd Floor Stair Platform – floor	<110

Table 1 – Results of Dust Wipe Sampling for VT ARNG St. Albans Readiness Center on October 24, 2011.

Wipe Sample #	Sample Location	Result (µg/ft²)*
StA – 07	Former Firing Range – bullet trap floor	<110
StA – 08	Former Firing Range – exercise bench	<110
StA – 09	Former Firing Range – floor mat	130
StA – 10	Commo Room - desk	<110
StA – 11	Former Firing Range – floor below doorway	<110
StA – 12	Garage – filing cabinet	<110
StA – 13	2nd Floor – floor	<110
StA – 14	SQDNCO Office – floor	<110
StA - 15	S-1 Office - floor	<110
StA - 16	Basement Kitchen - counter	<110

*The recommended maximum level for adult exposures is 200 µg/ft² lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged drywall and joint compound was observed on the boiler room ceiling; a crumbling plaster patch was observed in the 2nd Floor hallway; damaged plaster was observed in two offices on the 1st floor (S-4 and Training NCO offices); and damaged green linoleum with black mastic was observed in the Training NCO office. Samples of each damaged material were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). The EPA defines an asbestos-containing material as one percent (1%) or more asbestos by visual estimation. The damaged drywall and joint compound in the boiler room and the mastic under the green linoleum in the Training NCO Office contained 2% Chrysotile asbestos. No asbestos was detected in the other samples.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on March 9, 2011, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of

North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the Drill Hall, the Stairway to the 2nd Floor, The Commo Room in the Basement, the Fitness Room in the Basement, the Custodian's Office and the Boiler Room. The illumination measurements indoors ranged from 2.5 foot candles (fc) to 138 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in February, 2011. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 67.9 to 78.2° F and 36.7 to 45.3% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 59.0° F and 42.1% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 462 to 882 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.2 to 1.2 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new custodial products are required per OSHA 29 CFR 1910.1200. **RAC 4**

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, water intrusion, noise hazards, visible mold and housekeeping. The results of the evaluation indicated industrial hygiene concerns in the following areas: peeling lead-based paint, accumulated lead-containing dust in one area, the presence of damaged suspect asbestos-containing materials, and lighting. Overall, the St. Albans Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

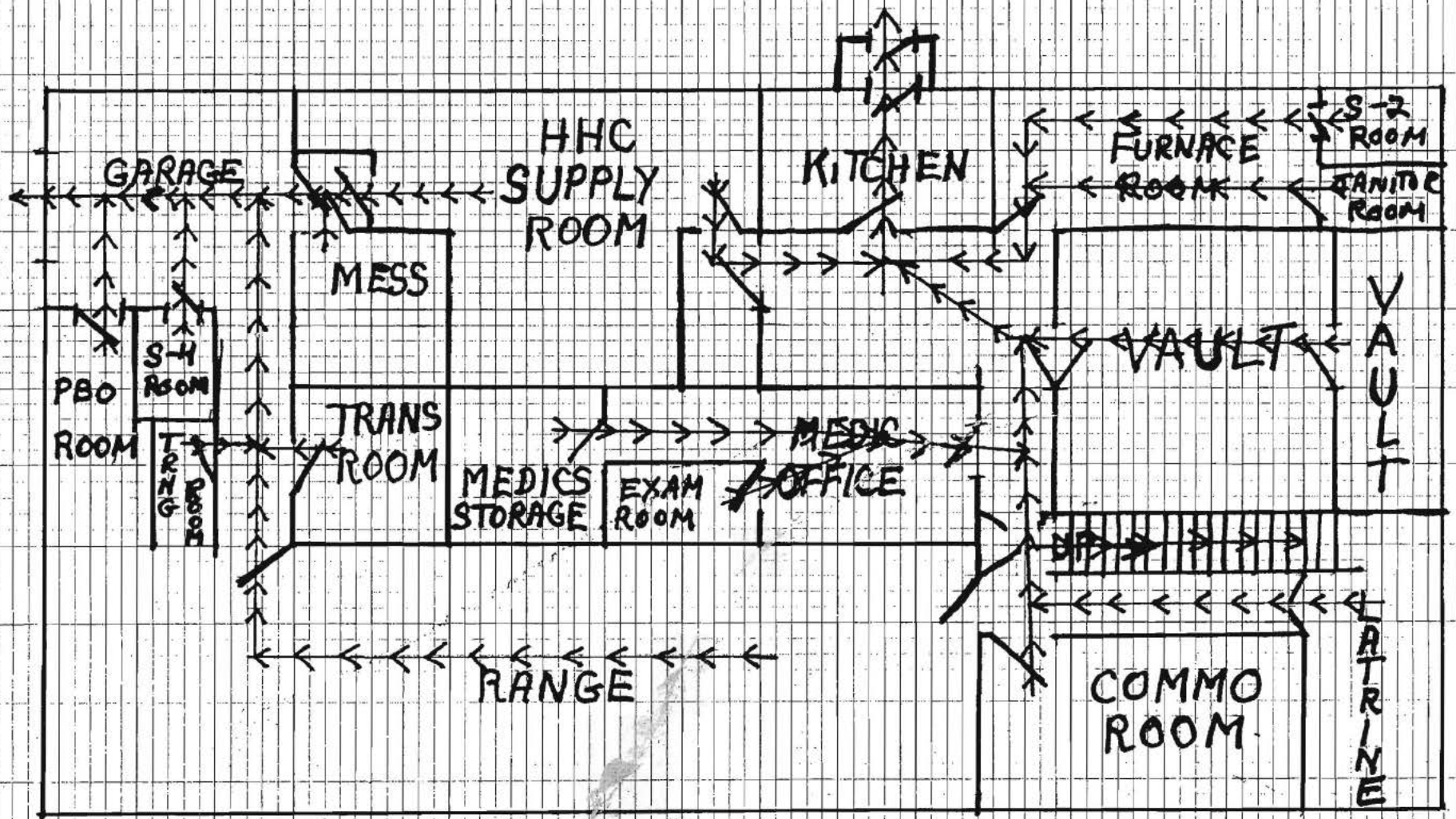
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

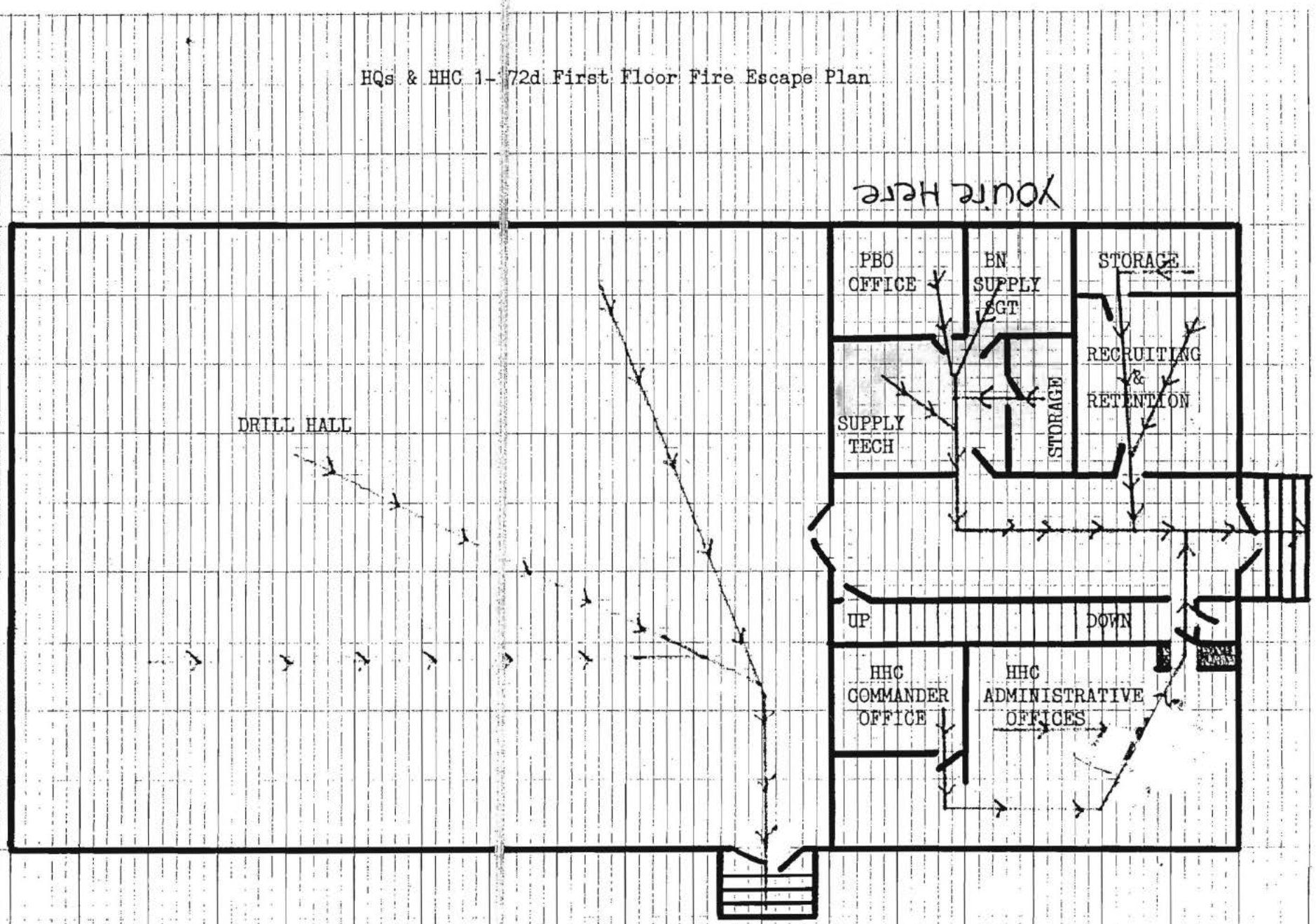
1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 10 October 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 28 March 2009.
8. Army Regulation (AR) 420-1 Army Facilities Management, 28 March 2009.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout

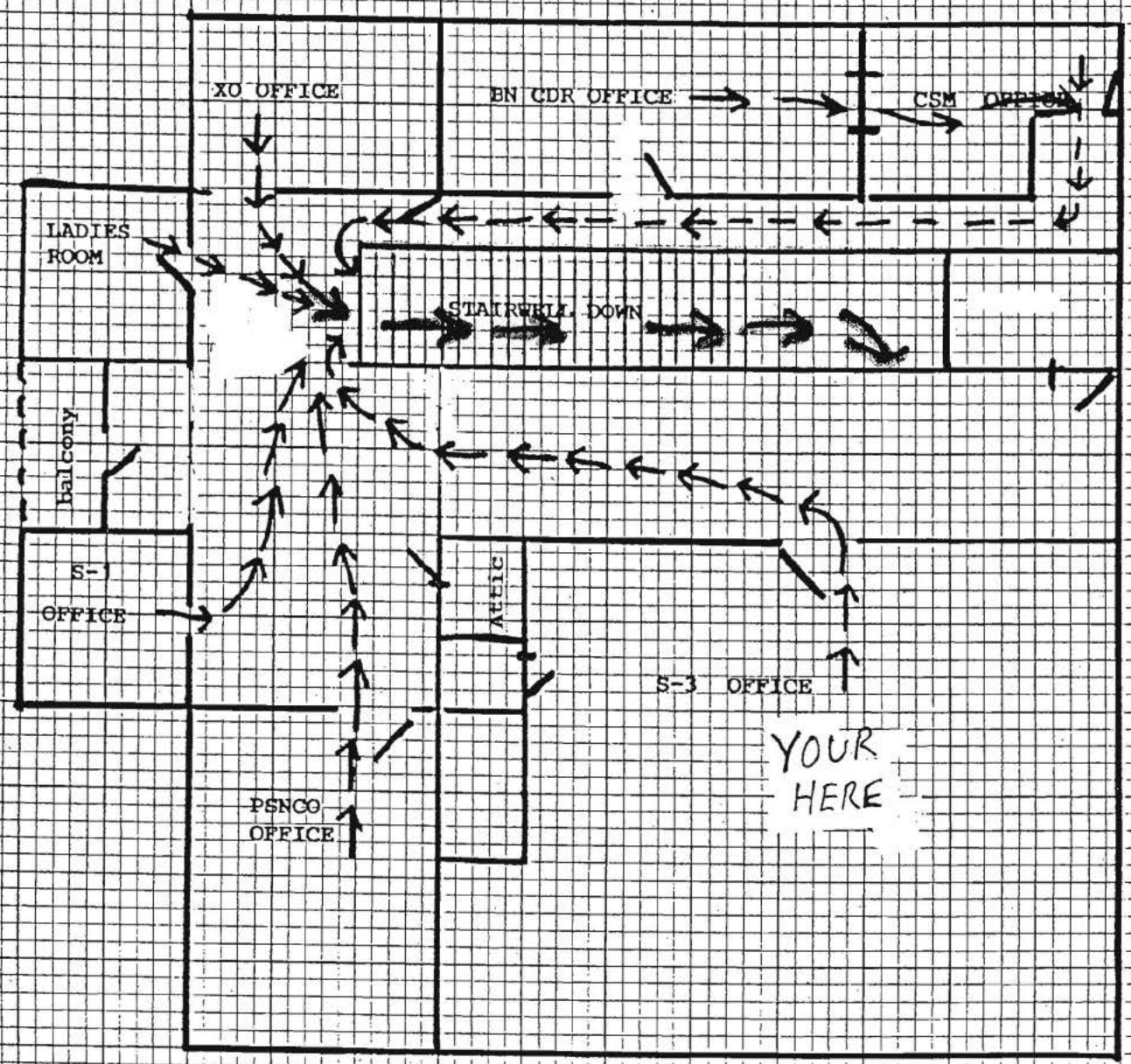
HQs & HHC 1-172d Basement Fire Escape Plan



HQs & HHC 1-172d First Floor Fire Escape Plan



HQ 2nd FLOOR FIRE ESCAPE PLAN



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	St. Albans RC	**Chain Of Custody:**	511730		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	St. Albans, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011

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
12010568	StA-Blk-01	Flame	Paint Chip	****	N/A	0.0082	%Pb		0.28	%Pb	
12010572	StA-Blk-04	Flame	Paint Chip	****	N/A	0.0069	%Pb		4.8	%Pb	
12010579	StA-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010580	StA-02	Flame	Wipe	****	0.222	54	ug/ft²	2400	11000	ug/ft²	
12010581	StA-03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010582	StA-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010583	StA-05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010584	StA-06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010585	StA-07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010586	StA-08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010587	StA-09	Flame	Wipe	****	0.108	110	ug/ft²	13	130	ug/ft²	
12010588	StA-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010589	StA-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010590	StA-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010591	StA-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010592	StA-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010593	StA-15	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010594	StA-16	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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:**	St. Albans RC	**Chain Of Custody:**	511730		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	St. Albans, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011

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.

Analyst: Non-Responsive

Technical Manager: Non-Responsive

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	St. Albans RC	**Chain Of Custody:**	511730
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	St. Albans, VT	**Date Analyzed:**	11/7/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12010569	StA-Blk-02	2	2	--	--	--	--	TR	10	--	--	88	DW	Multi	Layered	SW	
12010570	StA-Blk-02	2	2	--	--	--	--	--	TR	--	--	98	JC	White	Homogeneous	SW	
12010571	StA-Blk-03	NAD	--	--	--	--	--	--	TR	--	--	100	PL	White	Homogeneous	SW	
12010573	StA-Blk-05 PL	NAD	--	--	--	--	--	--	TR	--	--	100	PL	White	Homogeneous	SW	
12010574	StA-Blk-05 BC	NAD	--	--	--	--	--	--	TR	--	--	100	BC	Gray	Homogeneous	SW	
12010575	StA-Blk-06 PL	NAD	--	--	--	--	--	--	TR	--	--	100	PL	White	Homogeneous	SW	
12010576	StA-Blk-06 BC	NAD	--	--	--	--	--	--	TR	--	--	100	BC	Gray	Homogeneous	SW	
12010577	StA-Blk-07 FT	NAD	--	--	--	--	--	--	20	--	--	80	FT	Multi	Layered	SW	
12010578	StA-Blk-07 M	2	2	--	--	--	--	--	TR	--	--	98	MS	Black	Homogeneous	SW	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	St. Albans RC	**Chain Of Custody:**	511730
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	St. Albans, VT	**Date Analyzed:**	11/7/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

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

Technical Director Non-Responsive

Analyst(s) 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

OWI (410) 247-2024 — 159202 — 210 REV. 6.09

CHAIN OF CUSTODY

(Please Refer To This Number For Inquiries) 511730 page 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-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: St Albans RC
2. Job Location: St Albans, VT
3. Job #: J11-601 P.O. #: W912K6-09-A-0003
4. Contact Pers: [redacted]
5. Submitted By: [redacted] 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 ☐ 3 Day
☐ Next Day ☒ 5 Day + Date Due: 11/8/11
☐ 2 Day ☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Include with Report [redacted] aria enviro.com
☐ Email: [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) 9
☐ 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 2 (QTY) ghost 5 (QTY) (16 total)
☐ Pb Dust Wipe (wipe type 10x10) (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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA
StA-blk-01	Paintchip	10/24		
StA-blk-02	bulk PLMBC			
StA-blk-03	bulk			
StA-blk-04	chip			
StA-blk-05	bulk PLMBC			
StA-blk-06	bulk PLMBC			
StA-blk-07	floor tile/mastic			
StA-01				10x10
StA-02				206.4
StA-03				10x10
StA-04				
StA-05				

206.4 cm2 →

ANALYSIS

TEM	PCM	PLM	BAD	MOLD	AIR	BULK	DUST	WATER (TCLP/OTHER)	SOIL/PAINT	TAPE	SWAB
		X	X								
		X									
		X									
		X	X								
		X									
		X									
		X									
			X								
			X								
			X								
			X								
			X								

CLIENT CONTACT
(LABORATORY STAFF ONLY)
Date/Time: 11/3 Contact: JB By: MM
many layers on samples
Date/Time: 11/3 Contact: MM By: JB
Analyze all 4 layers
See Email in PLM folder 11/7/26
Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)
1. Date/Time RCVD: 11/1/11 @ 1015 Via: Fedex By (Print): [redacted]
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 7952 7173 2377

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
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OWI (410) 247-2024 152212 210 REV. 6.08

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 511730 (2) 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-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: St Albans RC
2. Job Location: St Albans, VT
3. Job #: 511-601
4. Contact Per: Non-Responsive
5. Submitted B: Non-Responsive PO #: W912K8-09-A-0003

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 @ aria enviro.com
☐ Fax: @us.army.mil
☐ 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 (QTY)
☒ Pb Dust Wipe (wipe type 10X10) 11 (QTY) (16 total)
☐ 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:
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☐ 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 (cm)	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER	SWAB
STA-06		10/24		10X10				X						
STA-07		↓		↓				↓						
STA-08														
STA-09														
STA-10														
STA-11														
STA-12														
STA-13														
STA-14														
STA-15		✓		✓				✓						
STA-16														

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: Non-Responsive
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments:

Appendix C
Photo Documentation

St. Albans, VT Readiness Center

Lyndonville RC Exterior

Drill Hall

Drill Hall 2

Drill Hall Gray Painted Windows

St. Albans, VT Readiness Center

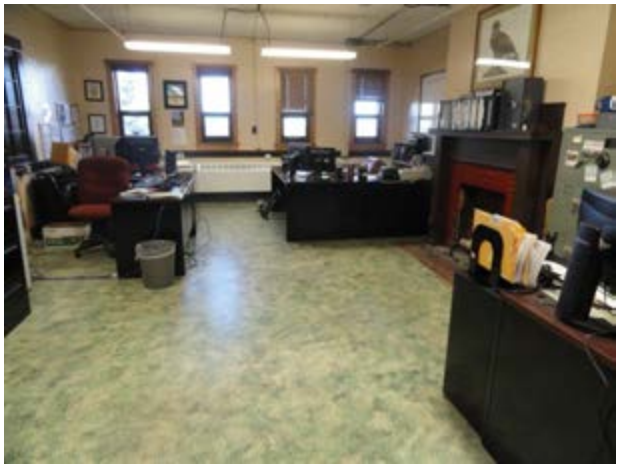
Drill Hall Gray Painted Windows

Drill Hall 3

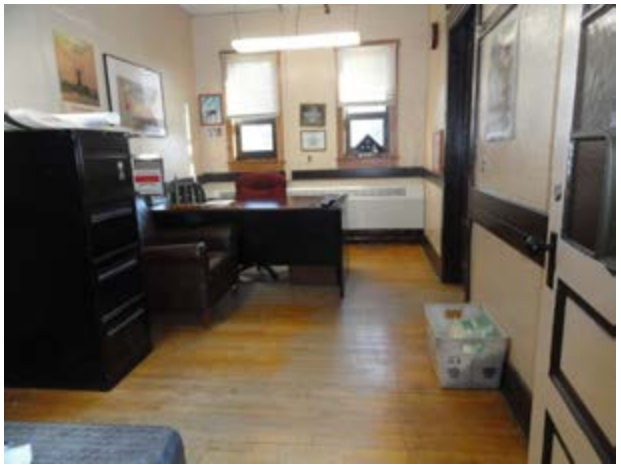
Office

Office

St. Albans, VT Readiness Center

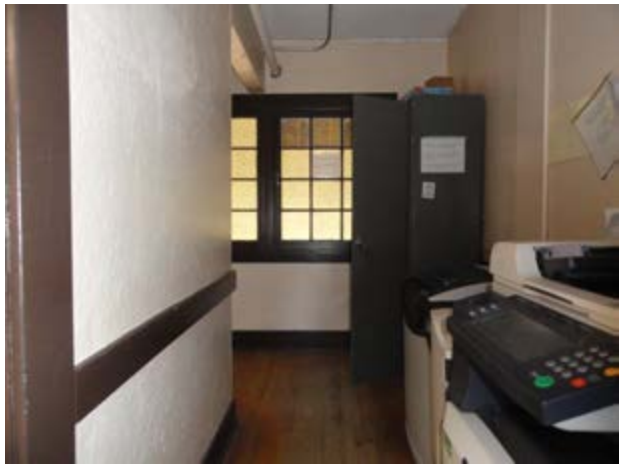


S-1 Office



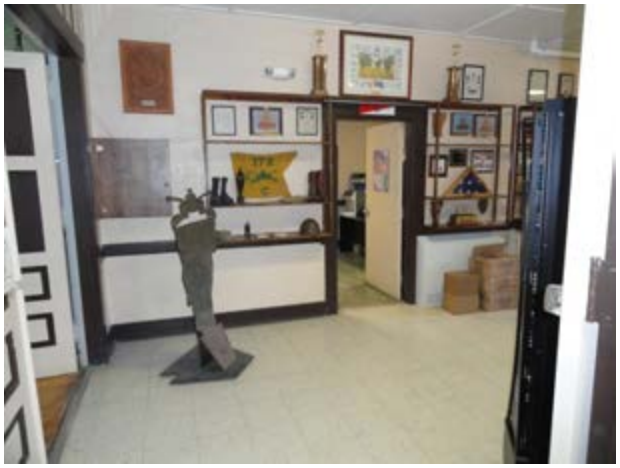
Office

2nd Floor



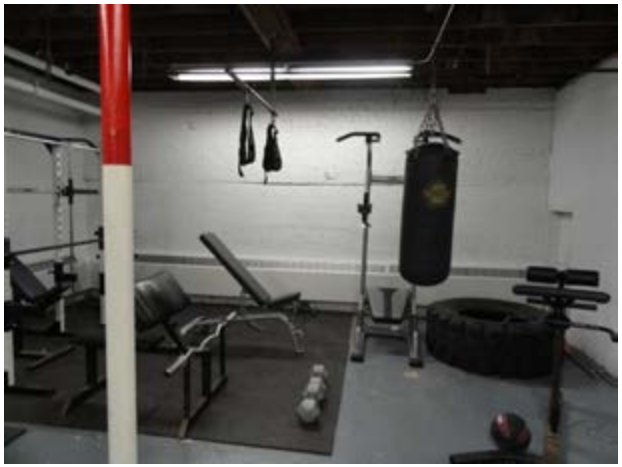
2nd Floor

St. Albans, VT Readiness Center



1st Floor Foyer

Office



Fitness Center - Former Firing Range

Fitness Center- Converted Firing Range

St. Albans, VT Readiness Center

Ceiling of Converted Firing Range

Heating System for Fitness Center

Basement Hallway

Basement Storage Garage

St. Albans, VT Readiness Center

Flammable Storage Cabinet

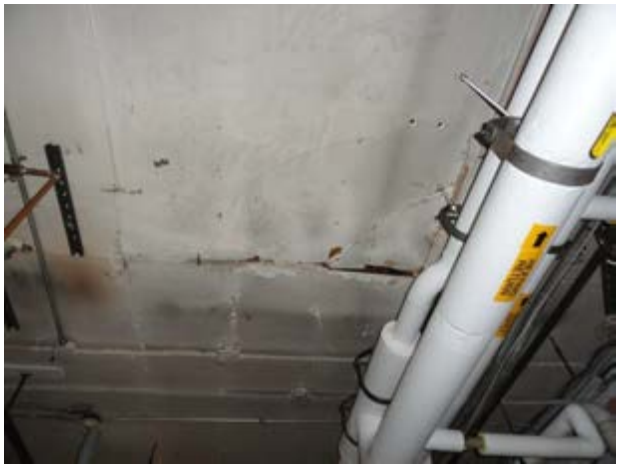
Custodian's Office

Commo Room

Boiler Room

St. Albans, VT Readiness Center

Boiler Room

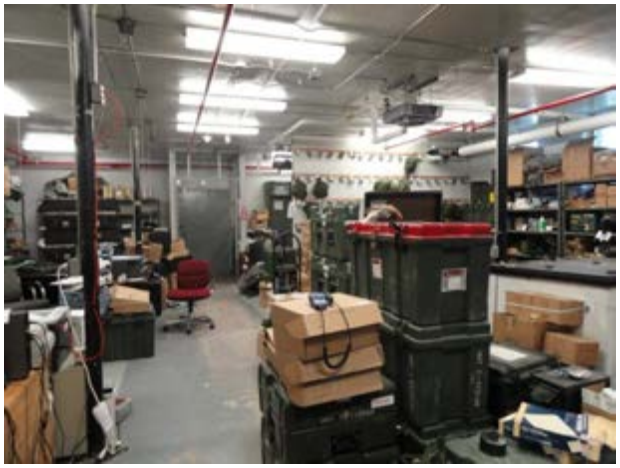


Damaged Drywall In Boiler Room

Boiler Room

Kitchen

St. Albans, VT Readiness Center



Supply Room

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	St. Albans	IAQ							Light		
Date	10/24/2011	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	St Albans RC			Serial Number		7565X0839020					Serial Number		K070003
Weather Conditions	Clear, Cool			Last Calibration		Feb-11					Last Calibration		9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		1	9:52	70.2		38.9		462		0.6		8-48	X	30-50
SQDNCO Office		1	10:42	70.0		44.6		790		0.7		30-82		30-50
SQDNXO Office		1	10:44	70.2		44.7		819		0.7		38-42		30-50
S-1 Office		1	10:45	70.6		45.3		829		0.3		26-98		30-50
Office		1	10:50	70.6		44.1		799		1.2		50-70		30-50
Hallway		1	10:50									60-78		5
Women's Bathroom		1	10:51									14-38		5
SQDNCSM Office on Second Floor		1	10:52	70.4		43.8		769		0.6		40-48		30-50
Hallway		1	10:55									35-45		5
Operations SGT Major Office		1	10:56	70.7		44.2		848		0.7		20-22		30-50
Stairs to Second Floor		1	10:58	70.1								2.5-50	X	5
Training NCO Office		2	11:04	78.2		36.7		788		0.5		28-60		30-50
Readiness NCO Office		1	11:04									30-60		30-50
S-2 Office		2	11:06	74.5		39.9		882		1.1		30-45		30-50
S-4 Office		1	11:07	73.6		41.1		840		1.0		27-75		30-50
Commo Room		4	11:10	73.0		39.4		632		0.9		7-138	X	30-50
Fitness Room		2	11:13	69.7		39.2		537		1.0		14-50	X	30
Garage		1	11:17	68.1		42.4		495		0.4		7-70	X	30
Custodian Room		2	11:19	67.9	X	45.1		663		0.5		14-76	X	30
Boiler Room		1	11:25	72.2		43.4		651		0.9		3-70	X	30
Kitchen		1	11:29	72.2		38.6		539		0.2		70-100		50
Supply Room		2	11:38	72.7		43.2		672		0.9		30-72		30
Recruitment Office												30-88		30-50
Foyer		2										11-40		10
Outside			11:40	59.0		42.1		426		1.6				

BEST AVAILABLE COPY

Industrial Hygiene Survey

Vermont Army National Guard (VTARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

St. Albans Readiness Center
18 Fairfield Street
St. Albans, VT 05478

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 22, 2012

AEI Project #: J12-685 3m VT St. Albans RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
St. Albans Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) St. Albans Readiness Center located at 18 Fairfield Street, St. Albans, VT 05478. Non-Responsive, CIH, CSP performed the evaluation on October 22, 2012. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for samples collected on a heater and a shredder in the Drill Hall (310 - 620 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect material was observed that was not addressed in the 2011 survey.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping required attention due to dust accumulation most likely associated with renovations in the building.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. The illumination measurements indoors ranged from 4 foot candles (fc) to over 1,000 fc.

Indoor Air Quality: Temperature and relative humidity measurements were within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 62.5° F and 40.1% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for custodial products in the caretaker's storage areas are required per OSHA 29 CFR 1910.1200.

Overall, the St. Albans Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
St. Albans Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) St. Albans Readiness Center located at 18 Fairfield Street, St. Albans, VT 05478. Non-Responsive, CIH, CSP performed the evaluation on October 22, 2012. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

Construction of the St. Albans Readiness Center was built in 1914. Renovations are currently taking place to replace windows and repaint the front walkway rails. The readiness center is staffed by 13 military administrative personnel and one part time civilian caretaker. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the St. Albans Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the St. Albans facility consist exclusively of supply and administrative duties. No other maintenance of vehicles or other physical tasks are performed at the facility. A small garage exists in the facility basement but it is only used for storage. Ground maintenance and upkeep of the building are the responsibility of the state and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed that was not addressed in the 2011 survey. To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for samples collected from a heater and shredder in the Drill Hall (310 - 620 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VTARNG
St. Albans Readiness Center on October 22, 2012.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
StA –W 01	Drill Hall – center of floor	<110
StA – W02	Drill Hall – top of wall unit heater	<110
StA – W03	Drill Hall – floor at end of entrance mat	<110
StA – W04	Drill Hall – dust on heater under new window in back	**620**
StA – W05	Drill Hall – top of "Secure" shredder	**310**
StA – W06	Former Firing Range – Fitness Center – weight bench	<110
StA – W07	Former Firing Range – Fitness Center - floor mat	120
StA – W08	Former Firing Range – Fitness Center - bullet trap side floor	<110
StA – W09	Classroom – floor (painted concrete)	<110

Table 1 – Results of Dust Wipe Sampling for VTARNG St. Albans Readiness Center on October 22, 2012.

Wipe Sample #	Sample Location	Result (µg/ft²)*
StA – W10	Kitchen – counter near microwave	<110
StA – W11	Stairs to 2nd Floor	110
StA – W12	HHT Office – Floor	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect material was observed that wasn't addressed in the 2011 survey.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed improvement to address accumulated dust most likely from current renovations.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. The illumination measurements indoors ranged from 4 foot candles (fc) to over 1,000 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7656X, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 67.9 to 72.5° F and 39.3 to 46.8% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 62.5° F and 40.1% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 529 to 727 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.2 to 1.6 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for custodial products in the caretaker's storage areas are required per OSHA 29 CFR 1910.1200.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the St. Albans Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

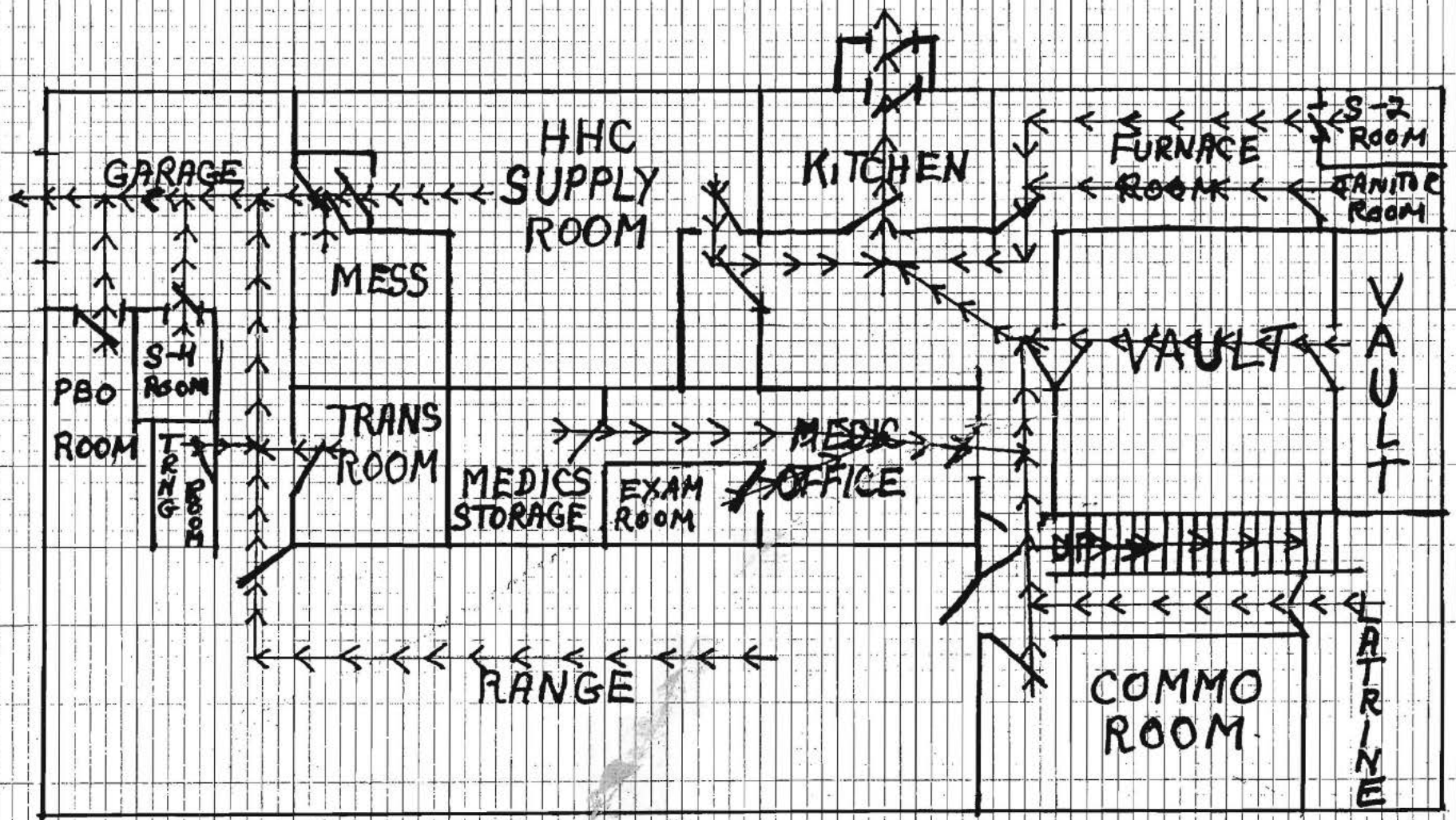
9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.

10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

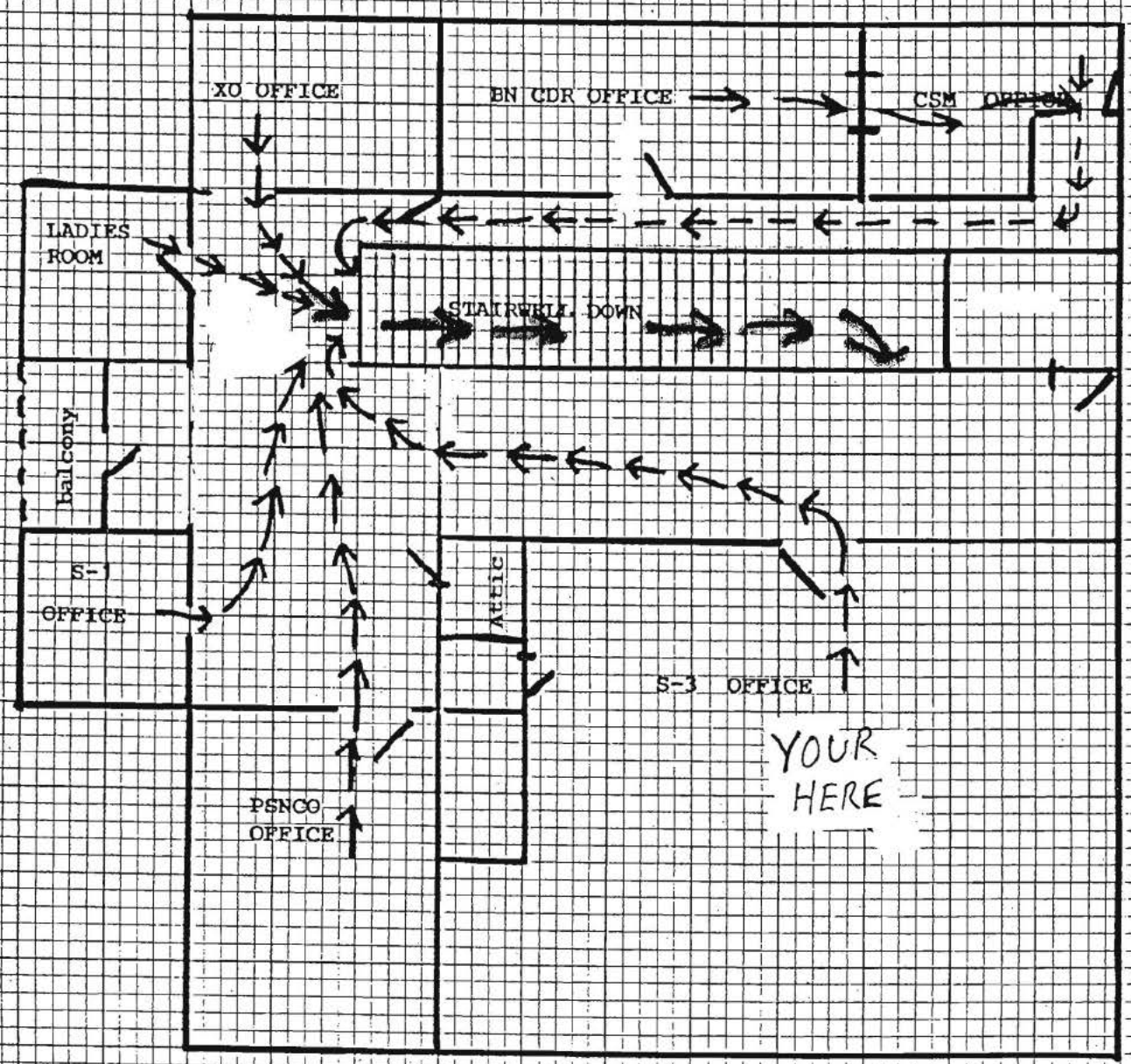
Appendix A
Building Layout

HQs & HHC 1-172d Basement Fire Escape Plan



HQs & HHC 1-172d First Floor Fire Escape Plan

HQ 2nd FLOOR FIRE ESCAPE PLAN



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	St. Albans RC	**Chain Of Custody:**	514373
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	St. Albans, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/12/2012

Report Date: 11/12/2012

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
13010745	StA-W 01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010746	StA-W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010747	StA-W 03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010748	StA-W 04	Flame	Wipe	****	0.250	48	ug/ft²	150	620	ug/ft²	
13010749	StA-W 05	Flame	Wipe	****	0.108	110	ug/ft²	33	310	ug/ft²	
13010750	StA-W 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010751	StA-W 07	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
13010752	StA-W 08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010753	StA-W 09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010754	StA-W 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010755	StA-W 11	Flame	Wipe	****	0.108	110	ug/ft²	12	110	ug/ft²	
13010756	StA-W 12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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
LAP #100470

Client:	National Guard Bureau	**Job Name:**	St. Albans RC	**Chain Of Custody:**	514373		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	St. Albans, VT	**Date Submitted:**	11/2/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/12/2012	**Report Date:**	11/12/2012

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.

Non-Responsive

Analys

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) 514373

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: St Albans RC
2. Job Location: St Albans, VT
3. Job #: 512-685 P.O. #: W912K6-09-A-0003
4. Contact Person: Non-Responsive @ Phone #
5. Submitted by: Signature: Non-Responsive

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

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 + 11/9/12	☒ Email: Non-Responsive ariaenviro.com
Comments:	❑ 2 Day Date Due:	❑ Fax: us.army.mil
	❑ Results Required By Noon	❑ Verbals: 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) If field data sheets are submitted, there is no need to complete bottom section.
*It is recommended that blank samples be submitted with all air and surface samples

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

Metals Analysis
❑ Pb Paint Chip (QTY)
~~❑~~ *Pb Dust Wipe (wipe type 10X10) 12 (QTY) cm ghost 1 = 232.2 cm²
❑ *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 #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	MATRIX: DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	SEE ATTACHED FIELD DATA SHEETS														

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 / 2 / 12 @ Via: FedEx By (Print): Non-Responsive Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: PM 2722 092

Aria Environmental, Inc
SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10-22-12

Job Site: St Albans RC

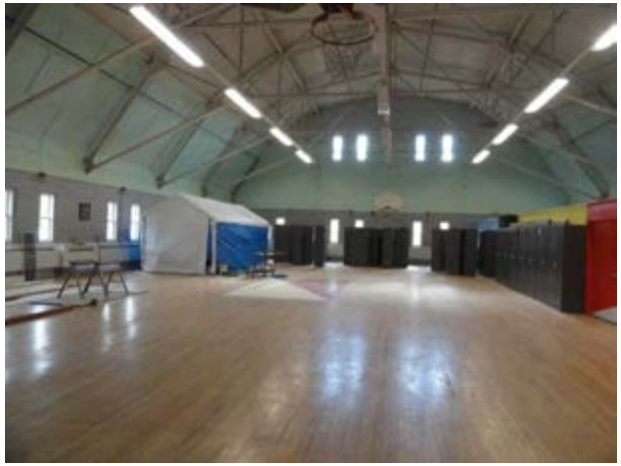
Project No.: 12-685

Inspector: Non-Responsive [redacted]

Sample No.	Sample Type	Sample Location	Dimensions (Area)
STA-W01		Drill Hall – center of floor	
STA-W02		Drill Hall – top of wall unit heater	
STA-W03		Drill Hall – floor at end of entrance mat	
232.2 cm² X STA-W04		Drill Hall – dust on heater under new window ("1.5" x 24")	3.81 cm × 60.96 = 232.2 cm2
STA-W05		Drill Hall – top of secure shredder	
STA-W06	FIFR	Fitness Ctr – weight bench	
STA-W07	"	" – rubber mat on floor	
STA-W08	"	" – floor on ballot trap side	
STA-W09		Classroom – floor (painted concrete)	
STA-W10		Kitchen – counter near microwave	
STA-W11		Stairs to 2nd Floor	
STA-W12		HHT office floor	

Appendix C
Photo Documentation

VT St Albans RC



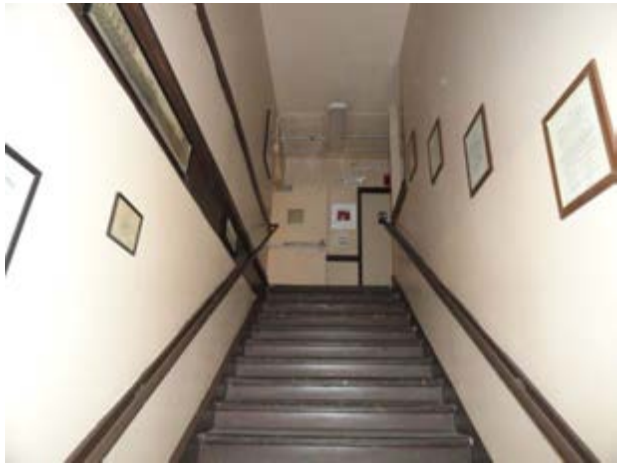
Drill Hall

Drill Hall

Drill Hall

Storage Room on Drill Hall floor

VT St Albans RC



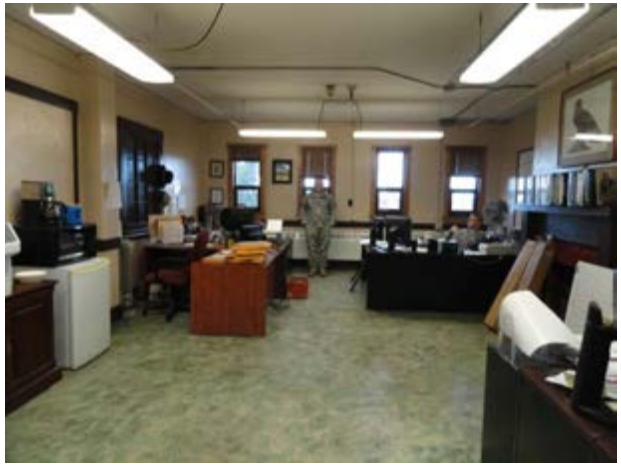
Stairs to 2nd Floor

2nd Floor Hallway

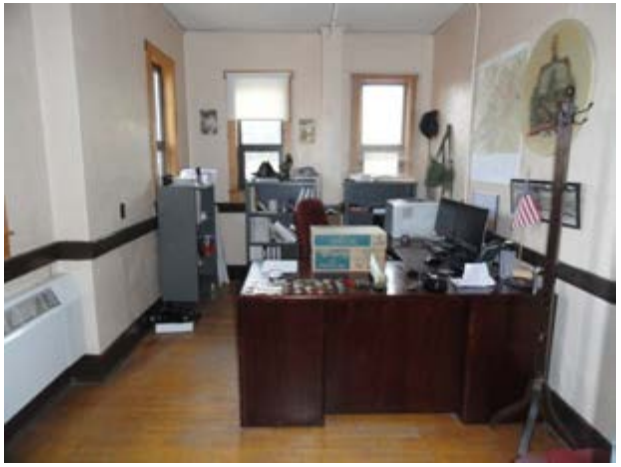
Office

2nd Floor Hallway

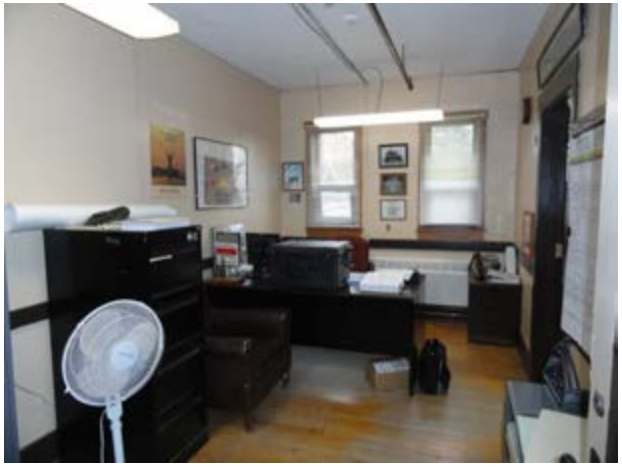
VT St Albans RC



Supply Office



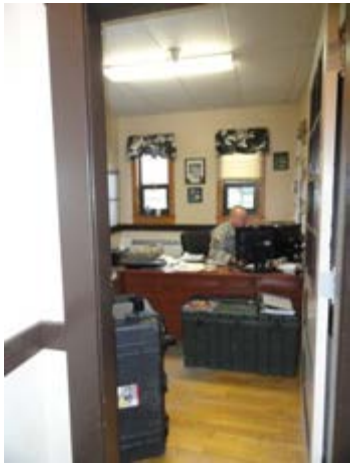
Office



Office

Hallway with copier

VT St Albans RC



Office

Access to attic

Janitor's closet

Janitor's closet

VT St Albans RC

Office

Office

Office

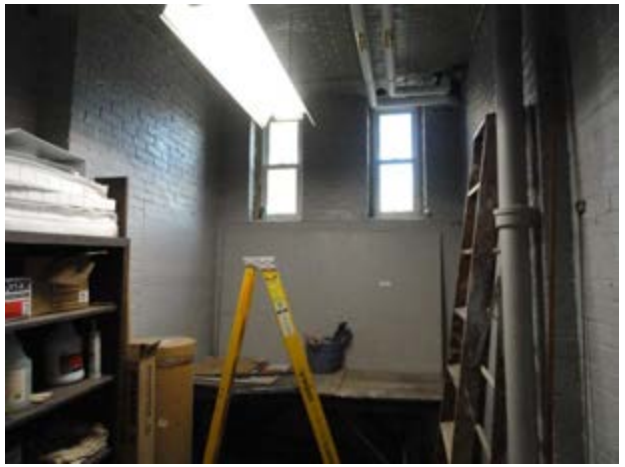
Window replacement in progress

VT St Albans RC

Boiler Room

Boiler Room

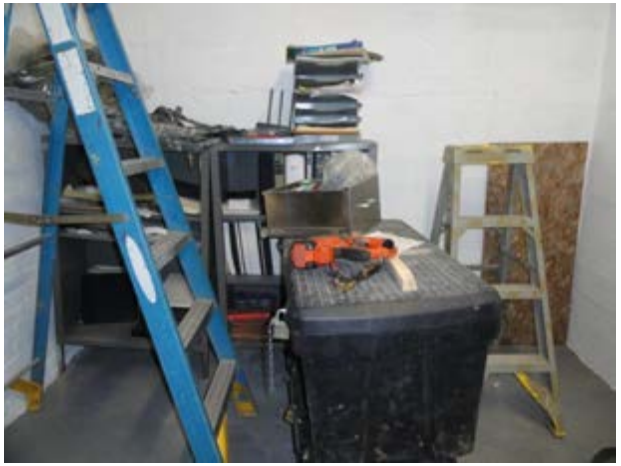
Peeling paint in Boiler Room



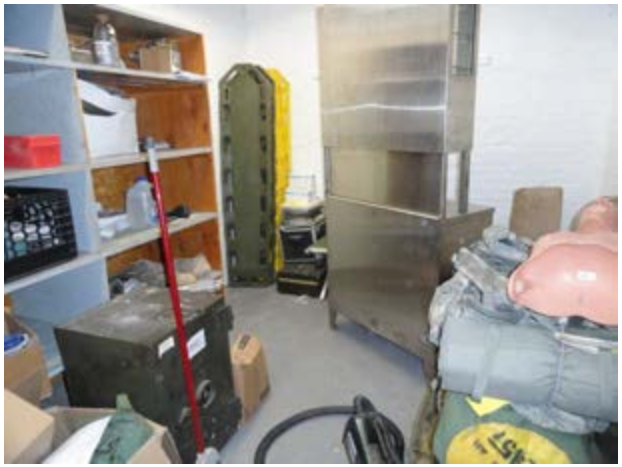
Basement storage

VT St Albans RC

Basement storage window replacement



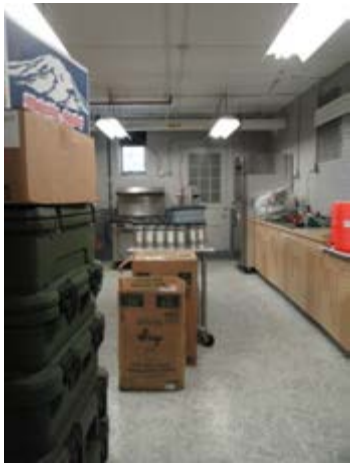
Clutter in Basement storage



Basement storage

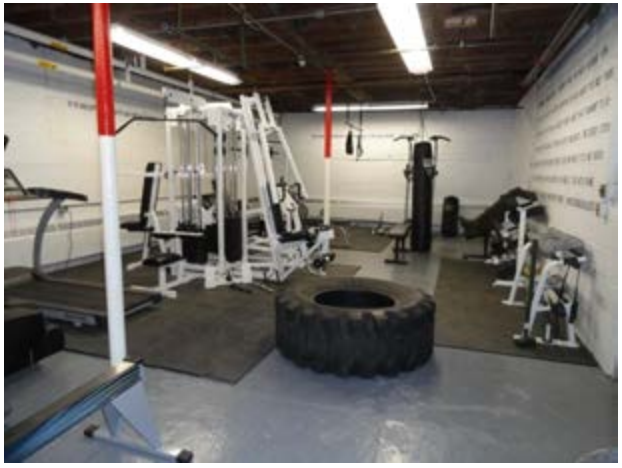
Basement Hallway

VT St Albans RC

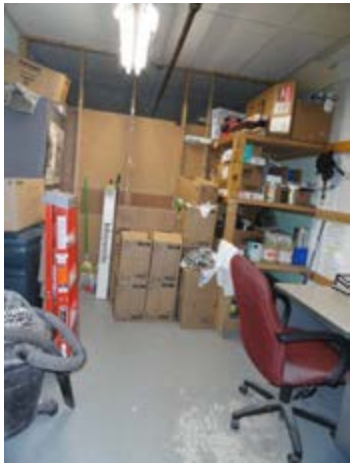


Kitchen

Conference room



Fitness Center and former range



Caretaker's office

VT St Albans RC

Basement flammable storage cabinets with MSDSs

Bath and shower room in basement

Lockerroom

Office

VT St Albans RC

Office

Office suite

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	St. Albans	IAQ								Light	
Date	10/22/2012	Inspector	Non-Responsiv	Instrument		Q-trak 7565-X						Instrument	Cal-Light 400
Facility Description	St. Albans RC			Serial Number		7565X0839019						Serial Number	K070003
Weather Conditions	Cool and sunny			Last Calibration		Mar-12						Last Calibration	16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
SQDN CO Office		1	1334	71.8		39.3		580		0.3		15-60		30-50
2nd Floor Center Office		1	1336	72.1		41.2		682		0.3		48-58		30-50
S-1 Office		5	1338	72.5		41.5		727		0.3		30-100		30-50
S-3 Office		1	1340	71.8		41.9		679		0.2		30-48		30-50
SDQN CSM Office		1	1342	71.9		40.2		597		0.4		10-63	X	30-50
Operation NCO		2	1345	72.3		40.5		646		0.3		30-75		30-50
2nd Floor Latrine		1	1346									17		5
1st Floor Janitor's Closet		1	1349	71.6		40.7		569		0.2		80		30
S4 Large Office		2	1351	71.5		41.1		571		0.2		20-75	X	30-50
S4 Back Office		1	1352									22-73	X	30-50
ISG Commander's Offi ce		1	1353									9-68	X	30-50
S4 Namco Office		1	1353									30-58		30-50
Basement Boiler Room		1	1355	71.5		42.1		529		0.8		5-110	X	30
Basement Storage		2	1358	72.0		42.2		583		0.4		40-50		30
Medical Unit Room		2	1400	72.0		42.9		667		1.6		27-100	X	30
Kitchen		2	1401	71.8		41.7		554		0.3		39-120	X	50
Supply Room		4	1402	71.0		43.4		582		0.6		30-70		30
Classroom/Conference Room		2	1404	71.1		43.3		563		0.2		4-82	X	30-50
Fitness Center		2	1404	70.7		45.3		617		0.2		14-36	X	30
Caretaker Office/Storage		1	1405	69.5		46.8		629		0.4		11-56	X	30
Storage Area		2	1408	67.9	X	46.0		529		0.3		11-54	X	30
Locker Room		2	1410									50-90		7
Latrine		2	1410									50-90		5
SDQN Recruiter 1		2	1411									13-75	X	30-50
SDQN Recruiter 2		1	1411									30-75		30-50
AAT Office		2	1412	69.8		44.8		642		0.2		23-75	X	30-50
Drill Hall		3	1413									20->1000	X	50
Outside			1003	62.5		40.1		375		0.9				

Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923
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Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Swanton Readiness Center – Swanton, Vermont

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

22 March 2004

National Guard Armory
Swanton Readiness Center – Swanton, Vermont

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

22 March 2004

Prepared by: Non-Responsive
Industrial Hygienist

Reviewed by: Non-Responsive
Business Line Manager

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List of Appendices

Executive Summary

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Swanton Readiness Center in Swanton, Vermont. Non-Responsive performed the evaluation on 15 July 2003 and 9 October 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 Exposure
- Lighting
- Converted Indoor Firing Range
- 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
- Water Damage
- Housekeeping
- Ergonomic Concerns

- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- Converted Indoor Firing Range
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at two locations in the assembly/drill hall. It is recommended that these surfaces and the areas immediately around these surfaces 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall, the Medic Office, and the storage room in the converted firing range. 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.
- 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.
- Indoor air quality measurements revealed that the humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in some areas; therefore consideration should be given to providing more lighting in these areas. 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.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Swanton Readiness Center in Swanton, Vermont. Non-Responsive performed the evaluation on 15 July 2003 and 9 October 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 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 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/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 hall. If there were any positive results from the drill floor, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at two locations. The sample obtained from the top of the heater unit flap surface (adjacent to the classroom) in the assembly/drill hall had a lead concentration of 440 $\mu g/ft^2$. The sample obtained from heater unit flap surface (adjacent to the lobby) in the assembly/drill hall had a lead concentration of 290 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the assembly hall, the Medic Office, and the storage room in the converted firing range. 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 for Lead

Breathing zone air sampling was conducted on one (1) full-time building occupant. (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 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 material were floor tiles in the three front offices adjacent to the lobby (approximately 577 square feet), and insulation in the boiler room (approximately 9 linear feet). The condition of the floor tiles materials was considered good since there was no damage to the tiles. The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage).

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

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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. The inspection did not reveal any water damage or visible mold.

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

2.3.2 Indoor Air Quality

Interviews with employees revealed no indoor air quality concerns at the armory. However, measurements for humidity revealed that levels exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory.

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 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. 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 some areas, including the Women's Latrine, Scout Office, Locker Room, PLT Office, Classroom, and Training Center Office.

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 converted range. The only remnant of the former firing range was the bullet trap area. This area was converted into storage rooms. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- floor at 120 micrograms lead per square foot ($\mu g/ft^2$); and
- stored item (shelf top) at < 180 $\mu g/ft^2$.

The lead levels were 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.

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 lead-based paint, visible mold, water damage, housekeeping, ergonomic conditions, 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, suspected asbestos-containing material, 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
Swanton, Vermont
Dates of Sampling: 15 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTSWA196-1	Drill Floor - On Floor (See Building Layout - Appendix B)	< 110
VTSWA196-2	Drill Floor – On Floor (See Building Layout – Appendix B)	110
VTSWA196-3	Drill Floor – On Floor (See Building Layout - Appendix B)	110
VTSWA196-4	Drill Floor – On Floor (See Building Layout - Appendix B)	< 110
VTSWA196-5	Drill Floor - On Floor (See Building Layout - Appendix B)	< 110
VTSWA196-6	Field Blank	< 12 µg
VTSWA196-9	Kitchen -- cabinet top	8.7
VTSWA196-10	Medic Office -- shelf top	68
VTSWA196-11	Administrative Office – desktop	10
VTSWA196-12	Field Blank	< 0.3 µg
VTSWA196-13	Classroom - heater vent top surface	9
VTSWA196-14	Training Center – desktop	2.8
VTSWA283-1	Assembly Room - soda machine top surface (See Building Layout – Appendix B)	36
VTSWA283-2	Assembly Room - fire alarm control box top surface (See Building Layout - Appendix B)	160
VTSWA283-3	Assembly Room – heater unit flap surface (adjacent to classroom) (See Building Layout - Appendix B)	440
VTSWA283-4	Assembly Room – locker top surface (See Building Layout Appendix B)	120
VTSWA283-1	Assembly Room - heater unit flap surface (adjacent to lobby) (See Building Layout – Appendix B)	290
VTSWA283-6	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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Swanton, Vermont
Date of Sampling: 15 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTSWA196-A1	Non-Responsive	0838-0938/60	2.4874	149.24	<0.007
VTSWA196-A2	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
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Swanton, Vermont
Date of Sampling: 15 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor – Training Center Office	3	395	67.0	75.7
Outdoors	0	362	33.7	81.3

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
Swanton, Vermont
Date of Sampling: 15 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Kitchen	42.3-76.8	70	Some areas
Women's Latrine	1.4-20.9	40	No
Scouts Locker Room	26.1-55.3	40	Some areas
Scout Office	18.5-39.1	70	No
Locker Room	12.1-38.5	40	No
PLT Office	29.6-38.9	70	No
Classroom	29.5-58.9	70	No
Locker Room/Mortor	32.1-62.5	40	Some areas
Storage Room 1	26.5-63.4	30	Some areas
Storage Room 2	15.2-46.3	30	Some areas
Training Center Office	27.1-64.3	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 5

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Swanton, Vermont

Date of Sampling: 15 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTSWA196-7	Stored Item shelf top	< 180
VTSWA196-8	Floor	120

[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.

Appendix A
HHIM Data Form(s)

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

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

SECTION 1. DEMOGRAPHIC DATA

RLOC	INSTALLATION	BLDG/RM NO.
	Swanton Armory Vermont ARNG	Swanton

OCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative OP/ADO

URVEY DATE	EVALUATOR (Initials)
15 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
ARMY NATIONAL GUARD	XX	Non-Responsive SSG

ELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-868-3887	Company E 1st Battalion	4	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO.OTHER
1	3	0	0	0

SECTION 2. FACILITY DATA

AB 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			EAR PLUGS			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-low	D Uncontrolled Physical
7439-92-1	Lead, Inorganic dusts and fumes, as Pb	2-moderate	C Uncontrolled Respiratory
1332-21-4	Asbestos (other)	2-Moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

Non-Responsive [redacted]		MI	SEX	Non-Responsive [redacted]	CATEGORY
		J	M		MIL
		J	M		MIL
		M	M	↓	MIL
			M	↓	CIV

SECTION 6. COMMENTS

____ No comments See attached sheet

Survey conducted by Michele Sevan, Building contains 3 Military-Full time staff and civilian employee: Employees perform mainly administrative tasks.

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.

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:**	VTSWA196	**Chain Of Custody:**	115806
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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
0359456	VTSWA196-1	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359457	VTSWA196-2	Flame	Wipe	****	0.111	108.00	ug/ft²	110	ug/ft²	
0359458	VTSWA196-3	Flame	Wipe	****	0.111	108.00	ug/ft²	110	ug/ft²	
0359459	VTSWA196-4	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359460	VTSWA196-5	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359461	VTSWA196-6	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359462	VTSWA196-7	Flame	Wipe	****	0.111	180.00	ug/ft²	< 180	ug/ft²	
0359463	VTSWA196-8	Flame	Wipe	****	0.111	108.00	ug/ft²	120	ug/ft²	

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]

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTSWA283	**Chain Of Custody:**	118719
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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
0402922	VTSWA283 -1	Furnace	Wipe	****	0.111	13.50	ug/ft²	36	ug/ft²	
0402923	VTSWA283 -2	Furnace	Wipe	****	0.111	67.51	ug/ft²	160	ug/ft²	
0402924	VTSWA283 -3	Furnace	Wipe	****	0.111	67.51	ug/ft²	440	ug/ft²	
0402925	VTSWA283 -4	Furnace	Wipe	****	0.111	67.51	ug/ft²	120	ug/ft²	
0402926	VTSWA283 -5	Furnace	Wipe	****	0.111	67.51	ug/ft²	290	ug/ft²	
0402927	VTSWA283 -6	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] 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

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTSWA196	**Chain Of Custody:**	118930
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/30/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	05-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
0404827	VTSWA196-9	Furnace	Wipe	****	0.111	2.70	ug/ft²	8.7	ug/ft²	
0404828	VTSWA196-10	Furnace	Wipe	****	0.111	13.50	ug/ft²	68	ug/ft²	
0404829	VTSWA196-11	Furnace	Wipe	****	0.111	2.70	ug/ft²	10	ug/ft²	
0404830	VTSWA196-12	Furnace	Wipe Blank	****	N/A	0.30	ug	< 0.3	ug	
0404831	VTSWA196-13	Furnace	Wipe	****	0.111	2.70	ug/ft²	9	ug/ft²	
0404832	VTSWA196-14	Furnace	Wipe	****	0.111	2.70	ug/ft²	2.8	ug/ft²	

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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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

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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m^3
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** SWA
Date: 196

Sample 1

Sample Number: VTSWA196-A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.526	2.448
	2.52	2.458
	2.523	2.448
	2.518	2.458
Average	**2.522**	**2.453**

Average Pre and Post **2.4874**

Time 1	8:38
Time 2	9:38
Total Time Sampled	**1:00**
Minutes Sampled	60.00

Volume **149.24 Liters**

Sample 2

Sample Number: N/A
Pump: N/A

	Pre Flow Rate	Post Flow Rate
	N/A	N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
Average	**N/A**	**N/A**

Average Pre and Post **N/A**

Time 1	N/A
Time 2	N/A
Total Time Sampled	**N/A**
Minutes Sampled	N/A

Volume **N/A** **Liters**

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** Swanton
Date: 7/15/03

Sample 1

Sample Number: VTSWA196-R1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2526	2448
	2520	2458
	2523	2448
Average	2518	2458
Average Pre and Post	2522	2453

Time 1 833
Time 2 938
Total Time Sampled
Minutes Sampled

Volume **Liters**

Sample 2

Sample Number:
Pump:

	Pre Flow Rate	Post Flow Rate
Average		
Average Pre and Post		

Time 1
Time 2
Total Time Sampled
Minutes Sampled

Volume **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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Swanton Readiness Center

13 Ferris Street
Swanton, VT 05488

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 24, 2011

AEI Project #: J11-601 4L VT Swanton RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Swanton Readiness Center located at 13 Ferris Street, Swanton, VT 05488. Non-Responsive CIH, CSP performed the evaluation on October 24, 2011. The point of contact for the facility was Non-Responsive . The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the boiler room on a vent to the outdoors. A sample of this peeling paint was analyzed and contained 0.14% lead by weight which would not be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (0.5%). Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for the sample collected from the floor in the custodial storage room that was part of the former firing range (3,700 µg/ft^2) and from a dusty painted vent in the Drill Hall (920 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect material was observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needs some improvement to reduce clutter and dust accumulation.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas. The illumination measurements indoors ranged from 8 foot candles (fc) to 150 fc.

Indoor Air Quality: Temperature measurements were mostly below the comfort ranges for the winter season, and relative humidity measurements were within the comfort ranges on the day of the survey. The outdoor temperature and relative humidity were 63.1° F and 45.9%, and the heating system was turned on for the first time of the season on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) were below the guidelines in all areas except for the training center where three people were working. Indoor levels of carbon monoxide (CO) ranged from 0.4 to 10.1 ppm; therefore, concentrations are below occupational exposure limits (25 parts per million (ppm)), but above the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the National Ambient Air Quality Standards (NAAQS) recommended CO concentrations (>9 ppm) in certain areas. The ASHRAE and NAAQS guidelines are based on 8 hour

averages. It is not likely that the CO concentrations at this readiness center would be sustained above 9 ppm for 8 hours. The heating system was turned on for the first time of the season on the day of monitoring. The carbon monoxide issue was reported immediately to the caretaker and the point of contact. Windows were opened to reduce concentrations while the heating system was warming up, and household-type CO detectors were recommended. The caretaker reported that there did not appear to be anything wrong with the heating system and that maintenance was up to date.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new products are required per OSHA 29 CFR 1910.1200.

Overall, the Swanton Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Swanton Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Swanton Readiness Center located at 13 Ferris Street, Swanton, VT 05488. Non-Responsive, CIH, CSP performed the evaluation on October 24, 2011. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Swanton Readiness Center was built in 1950. The readiness center is staffed by 4 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Swanton Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Swanton facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state employed Armorer and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on a vent in the boiler room. A sample of the peeling paint was submitted to AMA Analytical Services, Inc. of Lanham, MD for lead analysis. The sample contained 0.14% lead by weight which would not be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5%). To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the floor in the custodial storage room that was part of the former firing range (3,700 µg/ft^2) and from a dusty painted vent in the Drill Hall (920 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Swanton Readiness Center on October 24, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
SWA-01	Recovery Room – floor (Former Firing Range)	<110
SWA-02	Recovery Room – painted shelf (Former Firing Range)	<110
SWA-03	Custodial Storage – unpainted concrete floor (Former Firing Range)	**3,700**
SWA-04	Custodial Storage – metal shelf (Former Firing Range)	<110
SWA-05	Drill Hall – floor near former firing range	<110
SWA-06	Drill Hall – metal storage locker	<110
SWA-07	Drill Hall – painted heater vent	**920**
SWA-08	Drill Hall – floor	<110
SWA-09	Drill Hall – bay door	<110
SWA-10	Drill Hall – floor	<110

Table 1 – Results of Dust Wipe Sampling for VT ARNG Swanton Readiness Center on October 24, 2011.

Wipe Sample #	Sample Location	Result (µg/ft²)*
SWA-11	Kitchen – stone window ledge	<110
SWA-12	Family Readiness Room - floor	<110

*The recommended maximum level for adult exposures is 200 µg/ft² lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect ACM was observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on March 9, 2011, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas: the fitness center, the drill hall, the janitor's closet, the maintenance room and in the boiler room. The illumination measurements indoors ranged from 8 foot candles (fc) to 150 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in February, 2011. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 58.2 to 70.0° F and 43.1 to 59.5% Rh. Temperatures were mostly lower than the winter comfort ranges, and relative humidity measurements were within the comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 63.1° F and 45.9% on the day of monitoring. This was the first day of the season that the heating system was turned on and the system had not reached the set temperature yet.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 428 to 1,665 parts per million (ppm). The outdoor CO_2 concentration was 418 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas monitored except for the training center office where three people were working (1,665 ppm).

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.4 to 10.1 ppm; therefore, concentrations are below occupational exposure limits, but above the ASHRAE and the NAAQS-recommended CO concentrations in certain areas. The ASHRAE and NAAQS guidelines are based on 8 hour averages. It is not likely that the CO concentrations at this readiness center would be sustained above 9 ppm for 8 hours. The heating system was turned on for the first time of the season on the day of monitoring. The carbon monoxide issue was reported immediately to the caretaker and the point of contact. Windows were opened to reduce concentrations while the heating system was warming up, and household-type CO detectors were recommended. The caretaker reported that there did not appear to be anything wrong with the heating system and that maintenance was up to date.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program

be placed in every MSDS notebook. MSDSs for some new products are required per OSHA 29 CFR 1910.1200. **RAC 4**

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: water intrusion, peeling potentially lead-based paints, noise hazards, visible mold and the presence of damaged suspect asbestos-containing materials. The results of the evaluation indicated industrial hygiene concerns in the following areas: accumulated lead-containing dust in one area, lighting, hazard communication and MSDS updates, carbon monoxide concentrations above 9 ppm in some areas and housekeeping. Overall, the Swanton Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

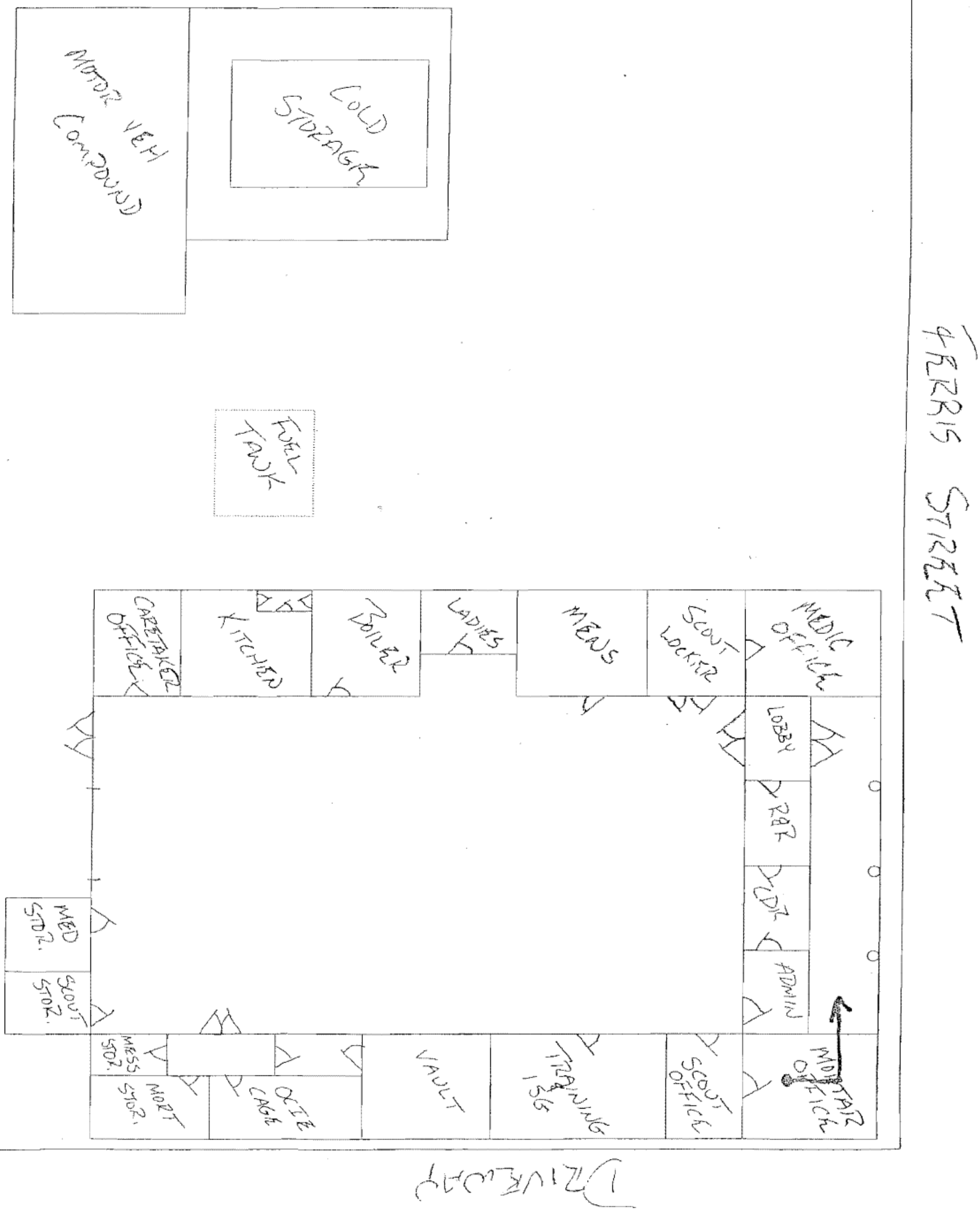
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 10 October 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 28 March 2009.

8. Army Regulation (AR) 420-1 Army Facilities Management, 28 March 2009.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Swanton RC	**Chain Of Custody:**	511732		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Swanton, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011

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
12010611	SWA-01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010612	SWA-02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010613	SWA-03	Flame	Wipe	****	0.108	110	ug/ft^2	400	3700	ug/ft^2	
12010614	SWA-04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010615	SWA-05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010616	SWA-06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010617	SWA-07	Flame	Wipe	****	0.111	110	ug/ft^2	100	920	ug/ft^2	
12010618	SWA-08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010619	SWA-09	Flame	Wipe	****	0.111	110	ug/ft^2	<12	<110	ug/ft^2	
12010620	SWA-10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010621	SWA-11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010622	SWA-12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
12010623	SWA-Blk-01	Flame	Paint Chip	****	N/A	0.01	%Pb		0.14	%Pb	

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:**	Swanton RC	**Chain Of Custody:**	511732		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Swanton, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011

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 Mar 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) 511732 page 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-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: Swanton RC
2. Job Location: Swanton, VT
3. Job #: 511732
4. Contact Person: [redacted] #: W912K6-09-A-0003
5. Submitted By: [redacted] @ phone # (410) 942-0273
Signature: [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 ❑ Next Day ❑ 2 Day ❑ 3 Day ❑ 5 Day + Date Due: 11/8/11
❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Inclu[redacted] with Report
☒ Email: [redacted] aria enviro.com
❑ 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 ℃)

Metals Analysis
❑ Pb Paint Chip (QTY)
❑ Pb Dust Wipe (wipe type 10X10) 12 (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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA (CM²)	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
SWA-01		10/24		10X10				X								
SWA-02																
SWA-03																
SWA-04																
SWA-05																
SWA-06																
SWA-07				(103,2)												
SWA-08				10X10												
SWA-09				(103,2)												
SWA-10				10X10												
SWA-11																
SWA-12																

103,2 ← CM² ↑

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

LABORATORY STAFF ONLY:
1. Date/Time RCVD: 11/1/11 @ 1015 Via: FedEx By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time:
4. Comments: 7952 7193 2377

CUSTODY: Initials:

[redacted]

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) 511732

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-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: Swanton RC
2. Job Location: Swanton, VT
3. Job #: JN-601
4. Contact Perso[redacted] P.O. #: W912K6-09-A-0003
5. Submitted by: [redacted] Signature: [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 +
❑ 2 Day Date Due: ____
❑ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

REPORT TO:
☒ I[redacted]with Report
☒ [redacted] @ariaenviro.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)

Metals Analysis
- ☒ Pb Paint Chip 1 wet (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)

SAMPLE INFORMATION

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
Swa-blk-01		4/29						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: ____

Appendix C
Photo Documentation

Swanton, VT Readiness Center

Swanton RC Exterior

Exterior

Drill Hall

Drill Hall

Swanton, VT Readiness Center

Cold Storage – Former Firing Range

Cold Storage – Former Firing Range

Flammable Storage Cabinet

Drill Hall

Swanton, VT Readiness Center

Cold Storage – Former Firing Range

Outdoor Storage Area

Exterior View

Outdoor Storage

Swanton, VT Readiness Center

Kitchen

Custodian's Office

Supply Storage Area

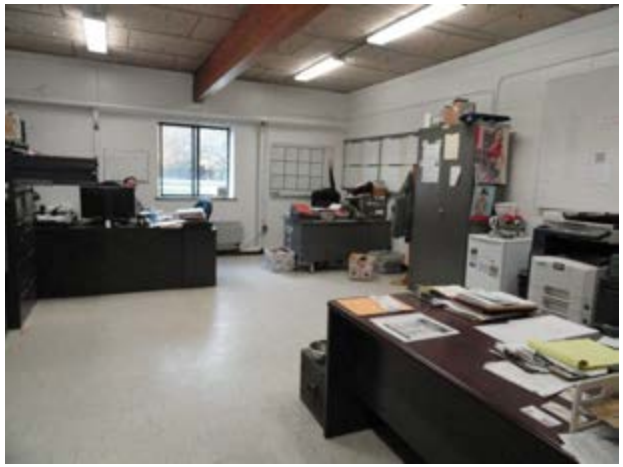
Supply Room

Swanton, VT Readiness Center

Supply Room

Flammable Storage Cabinet

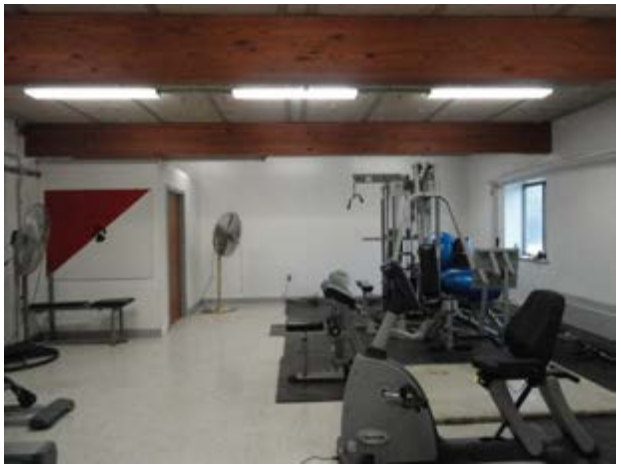
Supply Storage Area



Office

Swanton, VT Readiness Center

Classroom



Fitness Center

Boiler Room

Boiler Room

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Swanton	IAQ							Light		
Date	10/24/2011	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400
Facility Description	Swanton RC			Serial Number		7565X0839020					Serial Number		K070003
Weather Conditions	Clear, Cool			Last Calibration		Feb-11					Last Calibration		9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Training Room		1	13:59	64.5	X	49.7		524		2.5		48-74		30-50
Fitness Center		1	14:02									15-28	X	30
Family Readiness Center		1	14:05	64.5	X	48.7		495		10.1	X	42-68		30-50
Training Center		3	14:11	70.0		55.9		1665	X	9.5	X	50-75		30-50
Supply Room		2	14:19	66.9	X	43.1		635		8.5		33-85		30
Storage		1	14:20	64.3	X	45.1		611		8.5		40-60		30
Drill Hall		1	14:22	63.1	X	49.1		562		9.6	X	11-32	X	30
Custodian's Office		1	14:25	63.3	X	56.2		533		6.5		30-35		30-50
Kitchen		2	14:30	69.9		48.7		529		2.5		90-150		50
Kitchen Storage		2	14:31	67.0	X	47.7		486		1.6		38		5
JC		2	14:32							9.7	X	27	X	30
Locker Room		2	14:35	61.9	X	51.3		498		4.1		22-63		7
Maintenance Room		2	14:37	60.1	X	52.3		428		0.4		14-48	X	30
Foyer		1	14:39	61.8	X	57.7		537		0.7		35		5
Recruiting		2	14:40	62.6	X	57.5		735		0.6		40-80		30-50
Captain's Office		2	14:41	63.9	X	55.2		655		1.0		38-53		30-50
Recovery Room		1	14:46	59.0	X	54.9		475		6.1		30-40		30
Custodial Storage		1	14:53	58.2	X	59.5		536		7.3		40		30
Boiler Room		3	14:56	66.6	X	56.9		941		6.3		22-38	X	30
Women's Bathroom		1	16:05							6.0		8-30		5
Outside		1	16:13	63.1		45.9		418		0.1				

Industrial Hygiene Survey

Vermont Army National Guard (VTARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Swanton Readiness Center

13 Ferris Street
Swanton, VT 05488

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 23, 2012

AEI Project #: J12-685 3m VT Swanton RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Swanton Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Swanton Readiness Center located at 13 Ferris Street, Swanton, VT 05488. Non-Responsive, CIH, CSP performed the evaluation on October 23, 2012. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed in the boiler room on a vent to the outdoors. A sample of this peeling paint was sampled and analyzed as part of the 2011 survey and found to contain 0.14% lead by weight which would not be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (0.5%). Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for the sample collected from the floor in the cold storage room #2 that was part of the former firing range (270 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material. No damaged suspect material was observed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needs some improvement to reduce clutter and dust accumulation.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. The illumination measurements indoors ranged from 6 foot candles (fc) to 134 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 58.2° F and 37.9%. Indoor concentrations of carbon dioxide (CO_2) were below the guidelines in all areas except for the training center (1,700 ppm) where four people were working. Indoor levels of carbon monoxide (CO) ranged from 0.0 to 8.7 ppm; therefore, concentrations are below occupational exposure limits (25 parts per million (ppm)), but approaching the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the National Ambient Air Quality Standards (NAAQS) recommended CO concentrations of 9 ppm in the Drill Hall. The ASHRAE and NAAQS guidelines are based on 8 hour averages. It is not likely that the CO concentrations at this readiness center would be sustained

above 9 ppm for 8 hours. This problem was also addressed during last year's survey and household-type CO detectors were recommended. The point of contact said that CO detectors were purchased and received but not yet installed.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new products are required per OSHA 29 CFR 1910.1200.

Improper Materials in Flammable Storage Cabinets: Chemical products clearly labeled as non-flammable were stored in flammable storage cabinets. Incompatible products, non-flammable products, personal protective equipment such as dust masks, gloves and safety glasses and excess combustible materials such as paper, cardboard, or other combustible packaging material should not be stored in flammable storage cabinets. Requirements for flammable storage are regulated by OSHA 1910.106.

Improper storage: A cardboard box was stored next to a heater in the storage area, creating a potential fire hazard.

Overall, the Swanton Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Swanton Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Swanton Readiness Center located at 13 Ferris Street, Swanton, VT 05488. Non-Responsive, CIH, CSP performed the evaluation on October 23, 2012. The point of contact for the facility was Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Swanton Readiness Center was built in 1950. The readiness center is staffed by 5 military administrative personnel and one civilian caretaker. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Swanton Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Swanton facility consist exclusively of supply and administrative duties. Ground maintenance and upkeep of the building are the responsibility of the state and not part of the duties of National Guard personnel.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were taken in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on a vent in the boiler room that had been identified in last year's survey to contain less than 0.5% lead by weight. The sample submitted in 2011 contained 0.14% lead by weight which would not be considered lead-based by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5%). To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the floor in cold storage room #2 that was part of the former firing range (270 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VTARNG Swanton Readiness Center on October 23, 2012.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
SW-W01	Drill Hall – center of floor	<110
SW-W02	Drill Hall – top of shipping container	<110
SW-W03	Drill Hall – floor near former range	<110
SW-W04	Drill Hall – serving counter	<110
SW-W05	Drill Hall – outreach table	<110
SW-W06	Kitchen – counter near microwave	<110
SW-W07	Supply room – receiving window	<110
SW-W08	Cold Storage Room #1 – former range – floor	120
SW-W09	Cold Storage Room #2 – former range – floor	**270**
SW-W10	Classroom – children's table	<110

Table 1 – Results of Dust Wipe Sampling for VTARNG Swanton Readiness Center on October 23, 2012.

Wipe Sample #	Sample Location	Result (µg/ft²)*
SW-W11	Fitness Center – front of treadmill	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged suspect ACM was observed.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement to reduce dust and clutter.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. The illumination measurements indoors ranged from 6 foot candles (fc) to 134 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7656X, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 66.7 to 79.0° F and 36.2 to 52.0% Rh. Temperatures and relative humidity measurements were mostly within the winter comfort ranges on the day of monitoring. The outdoor temperature and relative humidity was 58.2° F and 37.9%.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 416 to 1,700 parts per million (ppm). The outdoor CO_2 concentration was 370 ppm on the day of monitoring. CO_2 measurements were below the guideline in all areas monitored except for the training center office where four people were working (1,700 ppm).

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 8.7 ppm; therefore, concentrations are below occupational exposure limits, but approaching the ASHRAE and the NAAQS-recommended CO concentrations in the Drill Hall. The ASHRAE and NAAQS guidelines are based on 8 hour averages. It is not likely that the CO concentrations at this readiness center would be sustained above 9 ppm for 8 hours. The carbon monoxide issue was reported in last year's survey report, and household-type CO detectors were recommended. The point of contact reported that the CO detectors were purchased and received but not yet installed.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new products are required per OSHA 29 CFR 1910.1200.

Improper Materials in Flammable Storage Cabinets: Chemical products clearly labeled as non-flammable were stored in flammable storage cabinets. Incompatible products, non-flammable products, personal protective equipment such as dust masks, gloves and safety glasses and excess combustible materials such as paper, cardboard, or other combustible packaging

material should not be stored in flammable storage cabinets. Requirements for flammable storage are regulated by OSHA 1910.106.

7 Conclusions

The results of the evaluation indicated few concerns with the facility. Overall, the Swanton Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.

9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.
19. OSHA 29 CFR 1910 Subpart L: Fire Protection
20. National Fire Protection Association (NFPA) 70: National Electrical Code (NEC) 2011.
21. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, November 3, 2006.

Appendix A
Building Layout

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Swanton RC	**Chain Of Custody:**	514387
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Swanton, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-285	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/9/2012

Report Date: 11/9/2012

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
13010951	SW-W 01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010952	SW-W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010953	SW-W 03	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010954	SW-W 04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010955	SW-W 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010956	SW-W 06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010957	SW-W 07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010958	SW-W 08	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
13010959	SW-W 09	Flame	Wipe	****	0.108	110	ug/ft²	29	270	ug/ft²	
13010960	SW-W 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010961	SW-W 11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

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:**	Swanton RC	**Chain Of Custody:**	514387		
Address:	301-lH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Swanton, VT	**Date Submitted:**	11/2/2012		
	Havre de Grace, Maryland 21078	**Job Number:**	J12-285	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/9/2012	**Report Date:**	11/9/2012

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.

Analyst: Non-Responsive

Technical Mana Non-Responsive

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
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(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 514387

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: Swanton RC
2. Job Location: Swanton, VT
3. Job #: 512,285 P.O. #: W912K6-09-A-0003
4. Contact Person: Non-Responsive @ phone # [redacted]
5. Submitted by: [redacted] Signature: Non-Responsive [redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

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

NORMAL BUSINESS HOURS
❑ Immediate ❑ 3 Day ❑ Results Required By Noon
❑ Next Day ☒ 5 Day + N/A
❑ 2 Day Date Due: _____

REPORT TO:
☒ Include [redacted] with Report
☒ Email: Non-Responsive [redacted] ariaenviro.com
❑ Fax: [redacted] us.army.mil
❑ Verbal [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)
*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
❑ Pb Paint Chip_____(QTY)
❑ *Pb Dust Wipe (wipe type 10X10 cm) 11 (QTY) ghost
❑ *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 #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	SEE ATTACHED FIELD DATA SHEETS														

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 / 2 / 12 @ _____ Via: FAX By (Print): Non-Responsive Sign: Non-Responsive [redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ _____ By (Print): _____ Sign: _____
3. Results Reported To: _____ Via: _____ Date: ____ / ____ / ____ Time: _____ Initials: _____
4. Comments: 857 2722 0192

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10-23-12

Job Site: Swanton RC

Project No.: J10-685

Inspector: Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
SW-W01		Drill Hall - center of floor	
W02		Drill Hall - top of shipping container	
W03		Drill Hall - floor near Former Range	
W04		Drill Hall - Serving counter	
W05		Drill Hall - table w/ literature	
W06		Kitchen - Counter near microwave	
W07		Supply Room - receiving window	
W08	FIFR	Cold Storage #1 - floor	
W09	"	Cold Storage #2 - floor	
W10		CR - children's activities table	
W11		Fitness Ctr - front of treadmill	

Appendix C
Photo Documentation

VT Swanton RC

Exterior of Swanton RC

Exterior

Cold Storage – Former Rang

Drill Hall

VT Swanton RC

Caretaker's Office

Kitchen

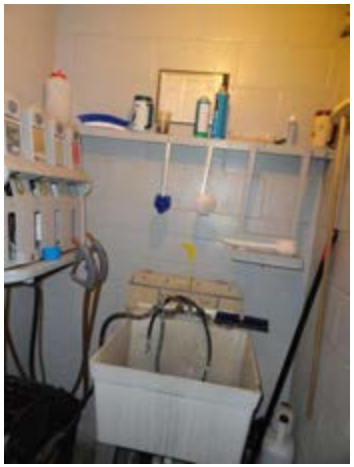
Kitchen

Kitchen Storage

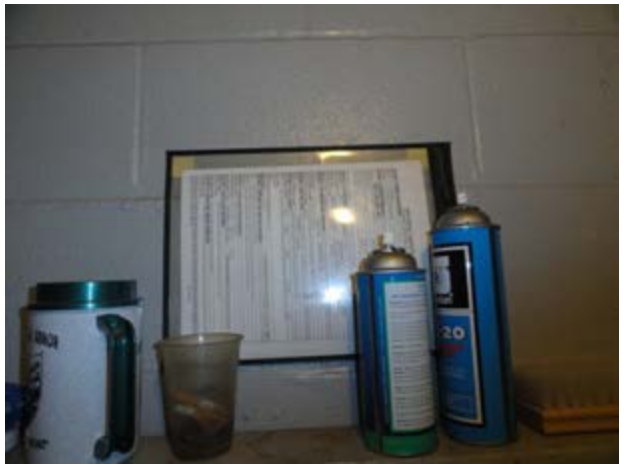
VT Swanton RC

Kitchen

Drill Hall



Janitor's Closet

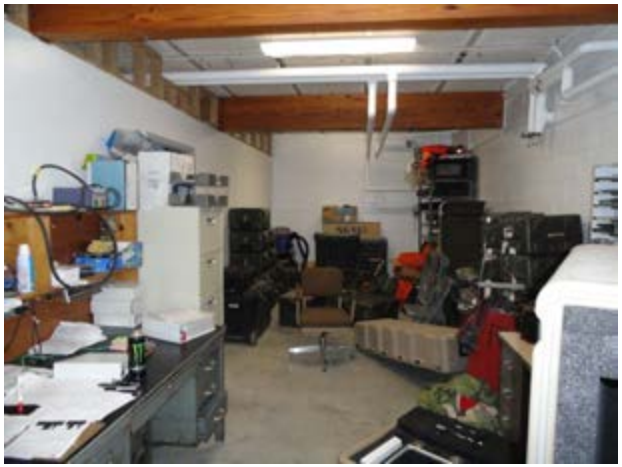


MSDSs in Janitor's Closet

VT Swanton RC

Drill Hall

Bunk Room in Locker Storage



Storage Area

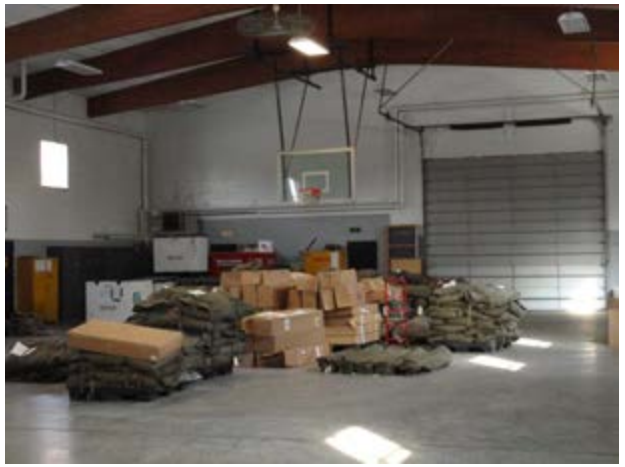
Storage and Office

VT Swanton RC

Storage

Storage

Storage near heater



Drill Hall

VT Swanton RC

Office

Classroom

Fitness Center

Fitness Center

VT Swanton RC

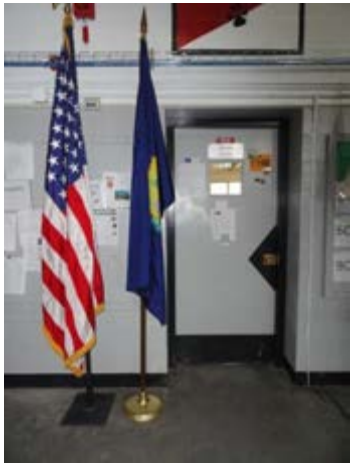
Moisture trapped in windows

Insufficient lighting in telecom closet

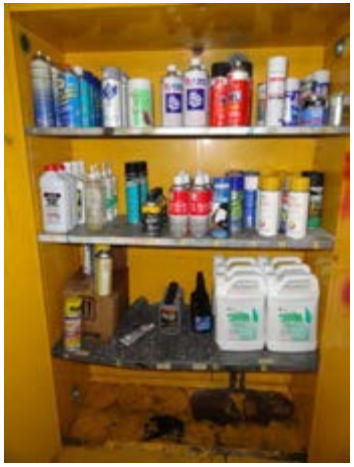
Telecom closet

Table for Children

VT Swanton RC



Office



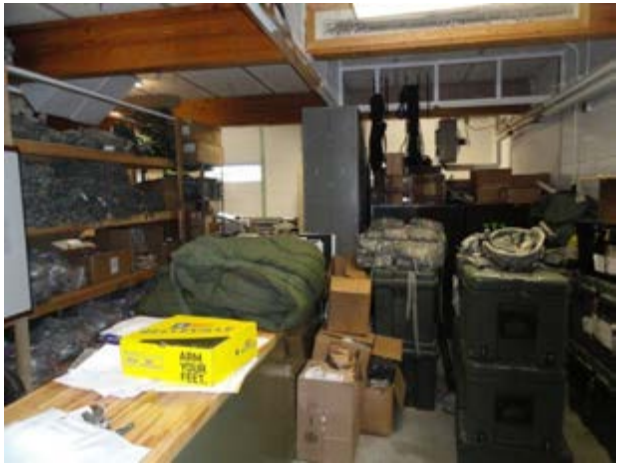
Flammable Cabinet with some non-flammable products

Supply Room

Supply Room

VT Swanton RC

Clutter in Supply Room



Supply Room

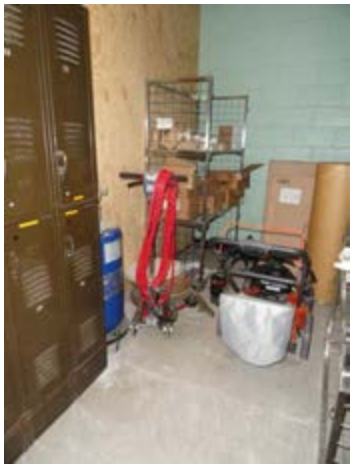
Boiler Room

Boiler Room

VT Swanton RC

Boiler Room

Flammable Storage



Cold Storage

Office

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Swanton	IAQ								Light	
Date	10/23/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument	Cal-Light 400
Facility Description	Swanton RC			Serial Number		7565X0839019						Serial Number	K070003
Weather Conditions	Cool and Sunny			Last Calibration		Mar-12						Last Calibration	16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		10	1203	68.7		44.6		550		8.7		25.0	X	50
Cold Storage #1		1	1204	66.7	X	44.0		493		5.7		12-15	X	30
Caretaker Office		1	1206	68.1		45.5		566		0.9		36.0		30-50
Kitchen		1	1207	72.7		38.5		435		0.3		60-90		50
Kitchen Storage		1	1208	74.2		36.2		462		0.3		30-60		10
Women's Latrine		1	1209									8-25		5
Janitor's Closet		1	1210									6	X	30
Locker & Bunk Room		1	1211	69.6		47.2		502		3.0		9-18	X	30
Locker Storage Area Office		1	1215	69.1		48.8		496		2.0		9-18	X	30-50
Storage Room #1		1	1216	68.8		48.4		466		2.3		21-43	X	30
Storage Room #2		1	1217	68.7		48.6		468		1.6		38-66		30
Recruiter's Office		2	1218	70.1		42.9		563		0.0		30-80		30-50
ISG Office		1	1220	71.1		40.3		428		0.0		19-20	X	30-50
Classroom		1	1223	70.7		43.6		427		0.2		13-32	X	30-50
Fitness Center		1	1225	71.7		42.8		416		0.0		10-44	X	30
Telecom Room		1	1225									15	X	30
Training Center Office		4	1227	72.7		52.0		1700	X	4.1		38-72		30-50
Supply Room		1	1230	69.1		48.1		420		2.8		10-44	X	30
Boiler Room		1	1237	79.0		37.9		495		1.2		35-134		30
Cold Storage #2		1	1240	69.5		41.4		555		6.8		12-20	X	30
Office		2	1333	69.5		43.4		453		0.0		10-21	X	30
Outside		1	1335	58.2		37.9		370		0.1				

Shaw Environmental, Inc.

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Knoxville, TN 37923
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Shaw® Shaw Environmental, Inc.

National Guard Armory
Vergennes Readiness Center – Vergennes, Vermont

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

01 March 2004

BEST AVAILABLE COPY

National Guard Armory
Vergennes Readiness Center – Vergennes, Vermont

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

04 January 2004

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. (Shaw) was contracted to perform an industrial hygiene evaluation for the Vergennes Readiness Center in Vergennes, Vermont. Non-Responsive performed the evaluation on 30 July 2003 and 9 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 Range
- 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
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs
- Ventilation System Evaluation

- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at four locations in the assembly/drill hall. It is recommended that these surfaces and the areas immediately around these surfaces 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall. 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.
- 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 the armory. The source of the water damage was likely from roof leaks, a high water table, and a breach in the building foundation. The sources of the water should be confirmed and actions taken to eliminate the source in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Visual mold was observed at the armory. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.
- Indoor air quality measurements revealed that the humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in most areas; therefore consideration should be given to providing more lighting in these areas. 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.

- Wipe sampling for lead in the converted firing range revealed a concentration above the recommended level on the floor. The floor must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in this area without protective clothing until the area has been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Vergennes Readiness Center in Vergennes, Vermont. Non-Responsive performed the evaluation on 30 July 2003 and 9 October 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 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 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/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 hall. If there were any positive results from the drill floor, 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 F) except at four locations. Two samples on the assembly/drill hall floor had lead concentrations of 250 and 210 $\mu g/ft^2$. The sample obtained from the heater unit flap surface in the assembly/drill hall had a lead concentration of 510 $\mu g/ft^2$. The sample obtained from the fire alarm control box in the assembly/drill hall had a lead concentration of 680 $\mu g/ft^2$. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the assembly hall. 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 for Lead

Breathing zone air sampling was conducted on one (1) full-time building occupant. (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 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 were floor tiles in the front three offices, foyer, classroom, and Day Room (Recruiter's Office) (approximately 2503 square feet), and insulation in the boiler room (approximately 21 linear feet). The condition of the floor tiles materials was considered good since there was no damage to tiles. The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage).

An operation 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. Both visible mold and water damage was observed at the armory. The water damage was observed in the men's shower room, foyer, kitchen, kitchen storage room, and the boiler room. The visible mold or remnants of mold was observed in the men's shower room. In addition, a green algae-like substance was observed in the boiler room.

The source of the water damage was likely from roof leaks in all of the rooms except the boiler room. It was indicated that the roof has been replaced. However, attention should be given to the water damage in the men's shower room. A high water table and a breach in the building foundation is likely the source of the water damage in the boiler room.

The sources of the water damage should be confirmed and actions taken to eliminate the source in order to prevent mold growth that may lead to indoor air quality problems. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate it.

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

2.3.2 Indoor Air Quality

Interviews with employees revealed no indoor air quality concerns at the armory. However, measurements for humidity revealed that levels exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory.

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 the HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 most areas, including the Kitchen, Officer's Latrine, Enlisted Men's Shower Room, Enlisted Men's Latrine, Front Office (adjacent to foyer), and Administrative Office.

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 converted range. The only remnant of the former firing range was the bullet trap area. This area was converted into a storage room. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- floor at 430 micrograms lead per square foot ($\mu g/ft^2$);
- stored item (shelf top) at < 110 $\mu g/ft^2$.

The lead level on the floor was above 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). The floor must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in this area without protective clothing until the area has been cleaned and re-sampled.

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 lead-based paint, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, water damage, visible mold, indoor air quality, surface lead contamination in the converted firing range, 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
Vergennes, Vermont
Dates of Sampling: 30 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTVER210-1	Drill Floor (See Building Layout - Appendix B)	250
VTVER210-2	Drill Floor (See Building Layout - Appendix B)	< 110
VTVER210-3	Drill Floor (See Building Layout – Appendix B)	< 110
VTVER210-4	Drill Floor (See Building Layout - Appendix B)	< 110
VTVER210-5	Drill Floor (See Building Layout – Appendix B)	210
VTVER210-6	Field Blank	< 12 µg
VTVER210-9	Classroom - - shelf surface	< 110
VTVER210-10	Kitchen – microwave top surface	< 110
VTVER210-11	Administrative Office - - desktop	< 110
VTVER210-12	Field Blank	< 12 µg
VTVER210-13	Recruiter's Office – desktop	< 110
VTVER210-14	Supply Room Office – desktop	< 110
VTVER283-1	Assembly Room heater unit flap surface (See Building Layout – Appendix B)	510
VTVER283-2	Assembly Room –fire alarm control box top surface (See Building Layout - - Appendix B)	680
VTVER283-3	Assembly Room – top of soda machine (See Building Layout – Appendix B)	97
VTVER283-4	Assembly Room - shelf top (See Building Layout – Appendix B)	74
VTVER283-5	Assembly Room - - table top (See Building Layout - - Appendix B)	33
VTVER283-6	Field Blank	0.47 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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Vergennes, Vermont
Date of Sampling: 30 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTVER210-A1	Non-Responsive	1447-1631/104	2.497	259.68	<0.004
VTVER210-A2	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
Indoor Air Quality Measurements for Carbon Dioxide, Humidity, and Temperature
National Guard Armory
Vergennes, Vermont
Date of Sampling: 30 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor - Classroom	1	466	60.8	75.9
Outdoors	0	414	61.2	77.6

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.

Table 4

Illumination Readings

National Guard Armory

Vergennes, Vermont

Date of Sampling: 30 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Converted Firing Range (Storage Room) 1	18.9-42.3	30	Some Areas
Converted Firing Range (Storage Room) 2	21.1-43.6	30	Some Areas
Kitchen	21.3-55.1	70	No
Officer's Latrine	2.6-10.1	40	No
Enlisted Men's Shower Room	2.6-14.1	20	No
Enlisted Men's Latrine	1.1-10.1	40	No
Locker room area	21.7-44.3	40	Some Areas
Front Office (adjacent to foyer)	21.3-57.7	70	No
Administrative Office	30.0-64.2	70	No
Supply Room	16.2-38.2	30	Some Areas
Recruiter's Office	33.1-76.7	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 ANSI/IES RP-1 and RP-7.

Table 5

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Vergennes, Vermont

Date of Sampling: 30 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTVER210-7	Floor	620
VTVER210-8	Stored Item - shelf top	<110

[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.

Appendix A
HHIM Data Form(s)

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

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

SECTION 1. DEMOGRAPHIC DATA

RLOC	INSTALLATION	BLDG/RM NO.
	Vergennes Armory Vermont ARNG	Vergennes

OCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative OP/ADO

URVEY DATE	EVALUATOR (Initials)
30 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	KK	Non-Responsive : SFC

ELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-877-2982	1 Battalion (155 MM SP) 86 Field Artillery	4	8

IO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO.OTHER
1	4	0	0	0

SECTION 2. FACILITY DATA

AB 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			EAR PLUGS			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-Low	Uncontrolled D Physical
7439-92-1	Lead, Inorganic dusts & fumes, as Pb	2-moderate	C Uncontrolled Respiratory
1332-21-4	Asbestos (other)	2-moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive		K	M	Non-Responsive	MIL
		J	M		MIL
			M		MIL
			M		MIL
			M		CIV

SECTION 6. COMMENTS

No comments See attached sheet

Survey was conducted by Michele Senecal. Building contains 4 military employees (full-time) and 1 civilian caretaker (part-time). 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.

Appendix B
Building Layout

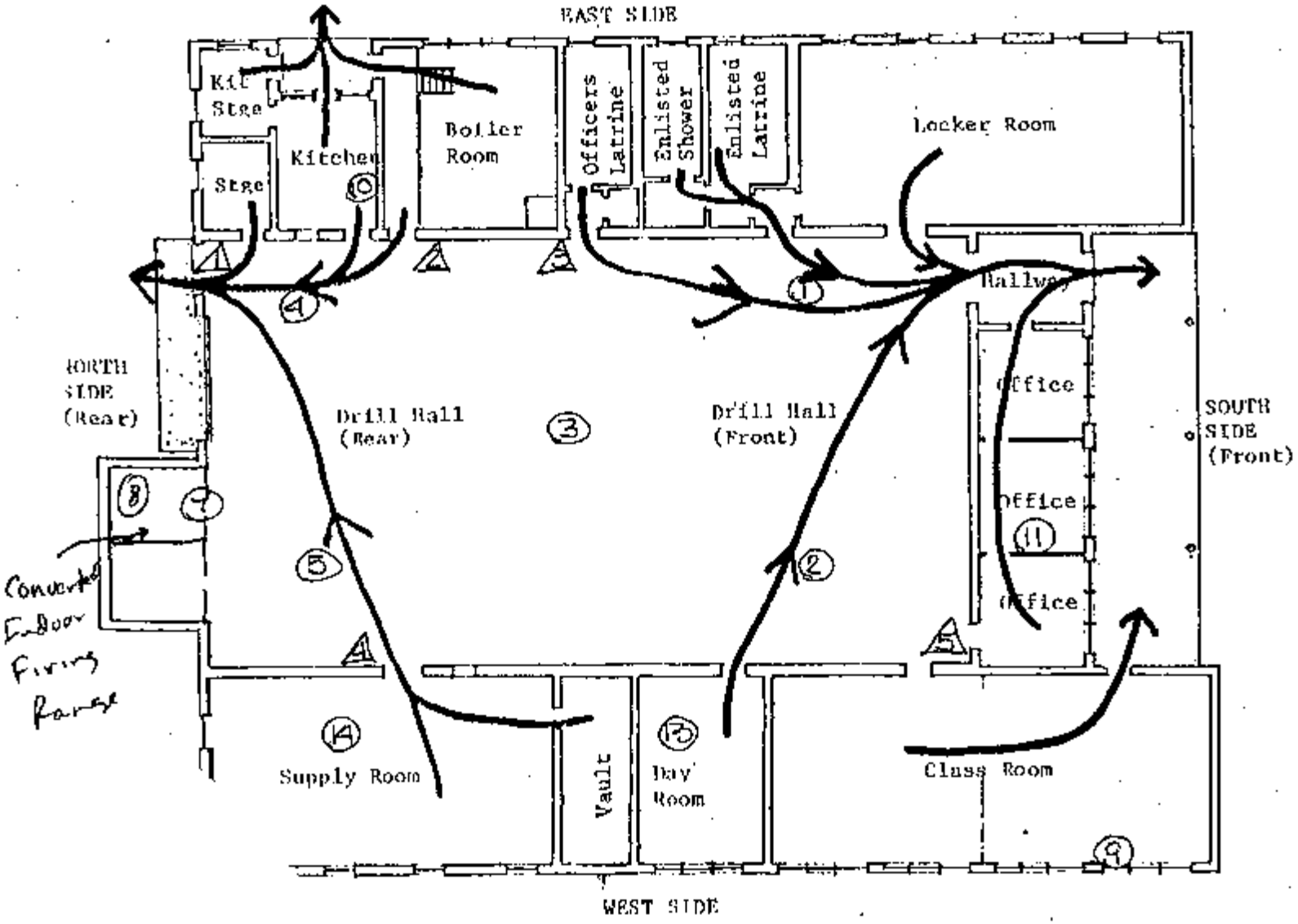
BATTERY B
1 Battalion (155MM SP) 86 Field Artillery
State Armory, Vergennes, Vermont, 05491

SUBJECT: Fire Plan

1. Four (4) fire extinguishers are located on the drill hall floor:
   (a) Dry Chemical - Located between kitchen and boiler room
   (b) Dry Chemical - Located between water fountain and EM latrine
   (c) Dry Chemical - Located just to right of Day Room door
   (d) Dry Chemical - Located just to right of Supply Room door

2. The individual who discovers a fire will shout "FIRE" in a loud voice and turn in the alarm to the Vergennes Fire Department by telephone (877-2616). Any and all individuals under the direction of the Fire Marshall will return to the fire and try to extinguish it.

3. The following evacuation plan will be followed when a fire is discovered:



○ Sample door : 30 July 2003

△ Sample door : 09 October 2003

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:**	VTVER210	**Chain Of Custody:**	116190
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/8/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	08-Aug-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
0361014	VTVER210-1	Flame	Wipe	****	0.111	108.00 ug/ft²		250	ug/ft²	
0361015	VTVER210-2	Flame	Wipe	****	0.111	108.00 ug/ft²	<	110	ug/ft²	
0361016	VTVER210-3	Flame	Wipe	****	0.111	108.00 ug/ft²	<	110	ug/ft²	
0361017	VTVER210-4	Flame	Wipe	****	0.111	108.00 ug/ft²	<	110	ug/ft²	
0361018	VTVER210-5	Flame	Wipe	****	0.111	108.00 ug/ft²		210	ug/ft²	
0361019	VTVER210-6	Flame	Wipe Blank	****	N/A	12.00 ug	<	12	ug	
0361020	VTVER210-7	Flame	Wipe	****	0.111	108.00 ug/ft²		620	ug/ft²	
0361021	VTVER210-8	Flame	Wipe	****	0.111	108.00 ug/ft²	<	110	ug/ft²	

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

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTVER210	**Chain Of Custody:**	115943
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/18/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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
0362698	VTVER210-9	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362699	VTVER210-10	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362700	VTVER210-11	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362701	VTVER210-12	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362702	VTVER210-13	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362703	VTVER210-14	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	

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
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AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTGRE283	**Chain Of Custody:**	118714
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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 (ft^2)	Reporting Limit		Final Result		Comments
0402892	VTGRE283 -1	Furnace	Wipe	****	0.111	67.51	ug/ft^2	510	ug/ft^2	
0402893	VTGRE283 -2	Furnace	Wipe	****	0.111	135.01	ug/ft^2	680	ug/ft^2	
0402894	VTGRE283 -3	Furnace	Wipe	****	0.111	13.50	ug/ft^2	97	ug/ft^2	
0402895	VTGRE283 -4	Furnace	Wipe	****	0.111	13.50	ug/ft^2	74	ug/ft^2	
0402896	VTGRE283 -5	Furnace	Wipe	****	0.111	5.40	ug/ft^2	33	ug/ft^2	
0402897	VTGRE283 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.47	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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	Lead
Client Sample No.:	VTRED210-A2 through VTWIN210-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3799
DCL Sample ID No.:	03-23284 through 03-23312
Sample Receipt Date:	8/4/2003
Preparation Date:	08/07/03
Analysis Date:	08/07/03

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/m^3
VTRED210-A2	03-23284	0	ND	-
VTNEW209-A1	03-23285	210.24	ND	<0.005
VTNEW209-A2	03-23286	0	ND	-
VTBRA209-A1	03-23288	197.36	ND	<0.005
VTBRA209-A2	03-23289	0	ND	-
VTLYN209-A1	03-23290	186.67	ND	<0.005
VTLYN209-A2	03-23291	187.06	ND	<0.005
VTLYN209-A3	03-23292	0	ND	-
VTNOR213-A1	03-23293	376.81	ND	<0.003
VTNOR213-A2	03-23294	0	ND	-
VTLUD212-A1	03-23297	157.79	ND	<0.006
VTLUD212-A2	03-23298	275.40	ND	<0.004
VTLUD212-A3	03-23299	0	ND	-
VTWIN212-A1	03-23305	173.64	ND	<0.006
VTWIN212-A2	03-23306	0	ND	-
VTVER210-A1	03-23307	259.68	ND	<0.004
VTVER210-A2	03-23308	0	ND	-
VTRED210-A1	03-23309	158.68	ND	<0.006
VTWIN210-A1	03-23310	218.92	ND	<0.005
VTWIN210-A2	03-23311	193.56	ND	<0.005
VTWIN210-A3	03-23312	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		99.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** VER
Date: 7/30/2002

Sample 1

Sample Number: VTVER210-A1
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.529	2.47
	2.537	2.475
	2.525	2.472
	2.497	2.47
Average	**2.522**	**2.472**

Average Pre and Post 2.4969

Time 1	14:47
Time 2	16:31
Total Time Sampled	**1:44**
Minutes Sampled	104.00

Volume 259.68 **Liters**

Sample 2

Sample Number: N/A
Pump: N/A

	Pre Flow Rate	Post Flow Rate
	N/A	N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
Average	**N/A**	**N/A**

Average Pre and Post **N/A**

Time 1	N/A
Time 2	N/A
Total Time Sampled	**N/A**
Minutes Sampled	N/A

Volume **N/A** **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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Vergennes Readiness Center
37 Monkton Road
Vergennes, VT 05491

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 19, 2012

AEI Project #: J12-685 3M VT Vergennes RC

_____

Non-Responsive, **DrPH, CIH**
Industrial Hygienist

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Vergennes Readiness Center

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Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Vergennes Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Vergennes Readiness Center located at 37 Monkton Road, Vergennes, VT 05491. Non-Responsive , DrPH, CIH performed the evaluation on October 19, 2012. The point of contact for the facility was SSG Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for a sample collected from the louver on the Modine Unit located near the former indoor firing range bullet trap in the Drill Hall (3,600 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No damaged suspect asbestos-containing material was observed. The boiler room was abated and a new boiler was installed in the week prior to the survey. Asbestos signs are still posted on the boiler room door.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of wet areas or mold growth was observed on the day of the survey. Facility personnel indicated that the boiler room flooded regularly before the site was regraded and new pavement was installed. Mold and fungus removal was performed in the boiler room.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas including the: platoon room, office 1, gym, cage storage, boiler room, kitchen and drill hall. The light fixtures in the boiler room were not installed after the boiler replacement project. The illumination measurements indoors ranged from 4.5 foot candles (fc) to 84.0 fc.

Indoor Air Quality: Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 66.9 to 69.6° F and 49.2 to 56.8% Rh. Temperatures were just below the lower end of the winter temperature range for thermal comfort in all but ten of the locations monitored. The outdoor temperature and relative humidity was 54° F and 67.8% on the day of monitoring. Indoor levels of CO_2 ranged from 404 to 856 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange. Indoor levels of CO ranged from 3.3 to 3.8 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDSs were last updated in April of 2012.

The National Fire Protection Association (NFPA) diamond found on the outdoor hazardous materials/hazardous waste storage cabinet was not complete. No warning numbers or special symbols were placed on the NFPA diamond.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Vergennes Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Vergennes Readiness Center located at 37 Monkton Avenue, Vergennes, VT 05491. Non-Responsive, DrPH, CIH performed the evaluation on October 19, 2012. The point of contact for the facility was SSG Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Vergennes Readiness Center was built in the 1950's. The readiness center is staffed by 2 administrative personnel and one civilian. The operations conducted at the facility include training and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Vergennes Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Vergennes facility consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. No peeling paint was observed.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected by wiping a Ghost Wipe over a measured area. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the Modine Unit louvers in the drill hall near the former indoor firing range bullet trap (3,600 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Vergennes Readiness Center on October 19, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft^2)*
VRC-1	Drill Hall – Top of Family Readiness kid's activity table. Along east wall between men's room and AED.	100 cm^2	<110
VRC-2	Drill Hall – one foot northwest of stenciled No. 5 on the floor – Floor	100 cm^2	<110
VRC-3	Drill Hall – Supply Room counter	100 cm^2	<110
VRC-4	Drill Hall – Modine Heater Louver – Northwest corner bottom louver	1.75 inches x 19.5 inches	**3,600**
VRC-5	Drill Hall – 20 ft south of north wall, 18 ft west of east wall – Floor	100 cm^2	<110
VRC-6	Kitchen – east wall southern window sill	100 cm^2	<110
VRC-7	Vault – 7 ft west of east wall, 4 ft south of north wall – Floor	100 cm^2	<110

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Vergennes Readiness Center

Table 1 – Results of Dust Wipe Sampling for VT ARNG Vergennes Readiness Center on October 19, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft²)*
VRC-8	Broom Closet Storage (Former Bullet Trap) – Floor	100 cm²	<110
VRC-9	Hazmat Storage (Former Bullet Trap) Floor	100 cm²	<110
VRC-10	Hazmat Storage on Storage Cabinet	100 cm²	120
VRC-11	Drill Hall at entrance to Storage Rooms (Former Range) – 8 ft south of North wall, 25 ft east of west wall – Floor	100 cm²	<110
VRC-12	Office 1 – Top of Hutch on west wall	100 cm²	<110
VRC-13	Office 2 – Window sill on south wall	100 cm²	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No damaged, suspect asbestos-containing material was observed. The boiler room was abated and a new boiler was installed in the week prior to the survey. Asbestos signs are still posted on the boiler room door.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or visible mold growth was observed. Facility personnel indicated that the boiler room flooded regularly before the site was regraded and new pavement was installed. Mold and fungus removal was performed in the boiler room.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas including the: platoon room, office 1, gym, cage storage, boiler room, kitchen, and drill hall. The light fixtures in the boiler room were not installed after the boiler replacement project. The illumination measurements indoors ranged

from 4.5 foot candles (fc) to 84.0 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7656x, factory calibrated in July, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 66.9 to 69.6° F and 49.2 to 56.8% Rh. Temperatures were just below the lower end of the winter temperature range for thermal comfort in all but ten of the locations monitored. The outdoor temperature and relative humidity was 54° F and 67.8% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 404 to 856 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 3.3 to 3.8 ppm; therefore, concentrations

are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDS were last updated in April of 2012. The National Fire Protection Association (NFPA) diamond found on the outdoor hazardous materials/hazardous waste storage cabinet was not complete. No warning numbers or special symbols were placed on the NFPA diamond.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the Vergennes Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

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

2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.

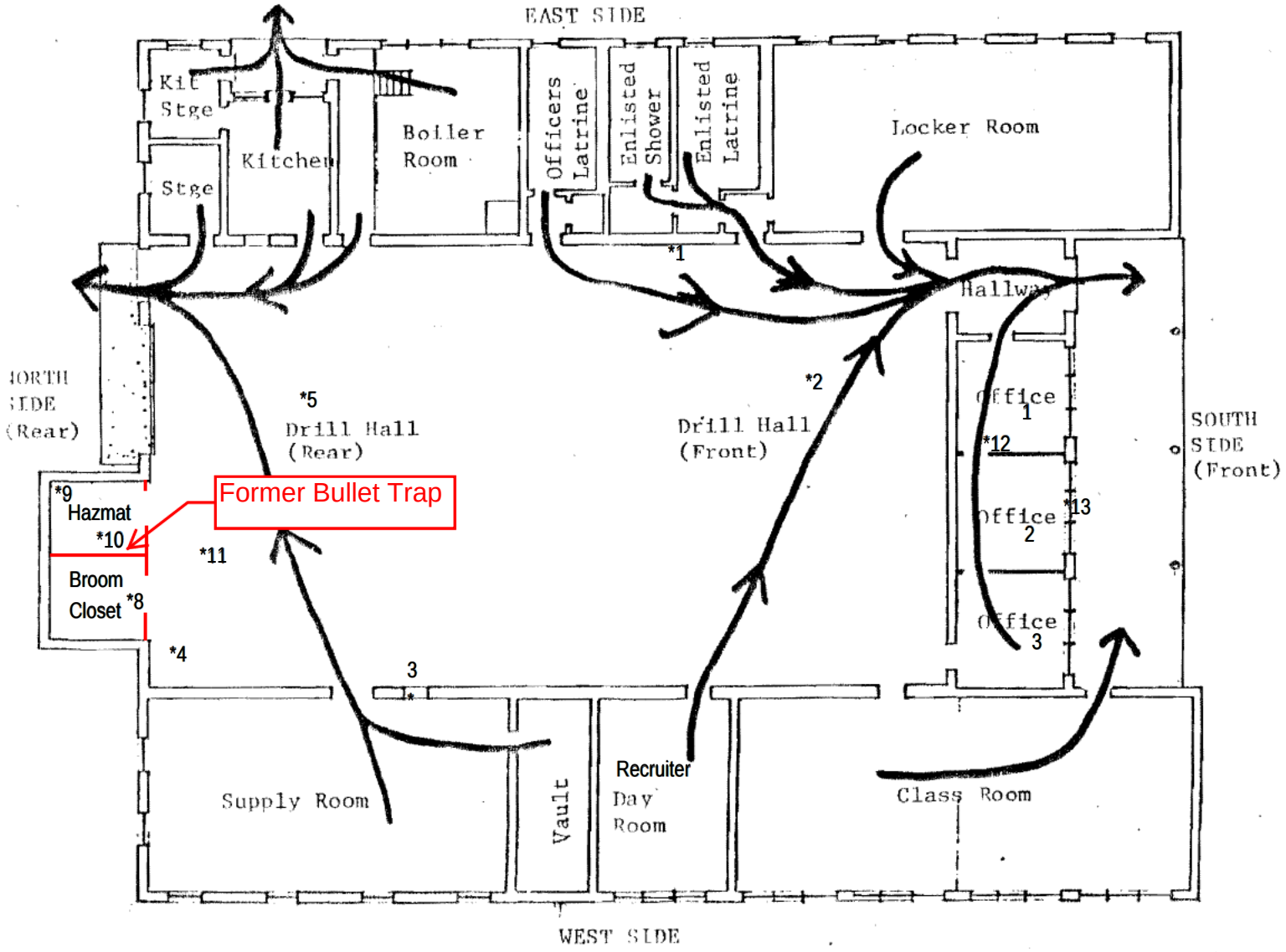
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.

4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.

5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.
19. National Fire Protection Association (NFPA) 70: National Electrical Code (NEC) 2011.
20. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, November 3, 2006.

Appendix A
Building Layout

3. The following evacuation plan will be followed when a fire is discovered:



Key:
*## - Lead Wipe Sample Location and Sample Number

N

Vergennes VT Readiness Center
Industrial Hygiene Survey
Floor Plan and Sample Location Plan
October 19, 2012

Aria Environmental, Inc.

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	VT ARNG 3M IH Surveys	**Chain Of Custody:**	514299
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Vergennes	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/2/2012 **Report Date:** 11/2/2012

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
13008772	VRC-1	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008773	VRC-2	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008774	VRC-3	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008775	VRC-4	Flame	Wipe	****	0.237	51	ug/ft^2	840	3600	ug/ft^2	
13008776	VRC-5	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008777	VRC-6	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008778	VRC-7	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008779	VRC-8	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008780	VRC-9	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008781	VRC-10	Flame	Wipe	****	0.108	110	ug/ft^2	12	120	ug/ft^2	
13008782	VRC-11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008783	VRC-12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13008784	VRC-13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	

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:**	VT ARNG 3M IH Surveys	**Chain Of Custody:**	514299
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Vergennes	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/2/2012 **Report Date:** 11/2/2012

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.

Analyst: 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) 514299

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: VTARNG 3M National Guard IH Surveys
2. Job Location: Vergennes
3. Job #: J12-685 P.O. #: W912K6-09-A-0003
4. Contact Person: [redacted]
5. Submitted by: [redacted] Signature [redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER 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] ariaenviro.com
Comments: ____	❑ 2 Day Date Due: ____	❑ Fax: [redacted] us.army.mil
	❑ Results Required By Noon	❑ Verbals [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)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ❑ Pb Paint Chip ____ (QTY)
- ☒ *Pb Dust Wipe (wipe type ____) 13 (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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
VRC-1 Thru	VRC-13						✓				✓				
	SEE ATTACHED FIELD DATA SHEETS														

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 / 24 / 12 @ ____ Via: ____ By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: ____ / ____ / ____ @ ____ By (Print): ____ Sign: ____
3. Results Reported To: ____ Via: ____ Date: ____ / ____ / ____ Time: ____ Initials: ____
4. Lab Comments: ____

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING
SURVEY SHEET

Date Collected: 10-19-12

Job Site: Vergennes RC.

Project No.: J12-685

Inspector: [redacted]

Sample No.	Sample Type	Sample Location	Dimensions (Area)
VRC-1		Drill Hall - Kids Activity Table along E wall btw Mens Room & AED	100 cm²
VRC-2		Drill Hall Floor - 1' NW of Stenciled No 5 on the floor	100 cm²
VRC-3		Drill Hall - Supply Room Corner	100 cm²
VRC-4		Drill Hall - Midline Heater NorthWest corner bottom louver	1.75" x 19.5"
VRC-5		Drill Hall Floor 20' S of N Wall 18' W of E	100 cm²
VRC-6		Kitchen Window Sill East Wall southern window sill	100 cm²
VRC-7		Vault Floor 7' W of E 4' S of N	100 cm²
VRC-8		Broom closet Storage (former bullet trap) floor	100 cm²
VRC-9		Hazmat Storage (former bullet trap) floor 3' N of S 3' W of E	100 cm²
VRC-10		Hazmat Storage on ~~north bench~~ Storage Cabinet	100 cm²
VRC-11		Drill Hall at Entrance to Stg rooms in path of Range - 8' S of N wall 25' E of W	100 cm²
VRC-12		OFFICE 1 TOP OF HUTCH ON West Wall	100 cm²
VRC-13		OFFICE 2 WINDOW SILL - SOUTH Wall middle	100 cm²

Appendix C
Photo Documentation

VT Vergennes RC

Photo 1: Dedication plaque at Vergennes dated 1962.

Photo 2: Improperly secured compressed gas cylinder.

Photo 3: Fire extinguisher tags did not indicate recent inspection.

Photo 4: Typical cold storage.

VT Vergennes RC

Photo 5: Typical cold storage.

Photo 6: Inside storage unit.

Photo 7: Storage locker located in fenced outdoor storage area. Note: the NFPA signage is missing applicable hazard classifications.

Photo 8: Assembly Hall.

VT Vergennes RC

Photo 9: Storage room.

Photo 10: Arms vault.

Photo 11: Storage room.

Photo 12: Flammable materials storage room.

VT Vergennes RC

Photo 13: Inside flammable materials storage cabinet.

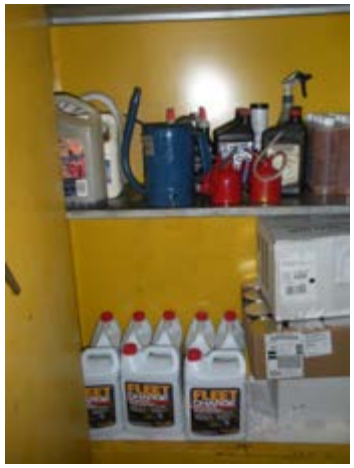


Photo 14: Inside flammable materials storage cabinet.

Photo 15: Kitchen.

Photo 16: Boiler room – post renovation.

VT Vergennes RC

Photo 17: Area of assembly hall formerly used as firing range bullet trap.

Photo 18: Platoon room.

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Vergennes	IAQ								Light		
Date	10/19/2012	Inspector	[redacted]	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Vergennes RC			Serial Number		7565x1228004						Serial Number		K040084EL
Weather Conditions	Rainy			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Office 1	Office	1	1015	69.6		51.7		550		3.8		27.7	X	30-50
Entry Vestibule	Corridor	var	1016	68.7		51.9		479		3.8		15.3		10
Classroom	Classroom	var	1017	67.7	L	56.6		422		3.8		63.7		30-50
Family Support	Office	1	1018	68.3	L	55.0		450		3.8		84.0		30-50
Server Room	Server	1	1019	68.9		55.0		438		3.6		78.0		30-50
Cage Storage	Storage	1	1020	67.1	L	52.5		440		3.5		4.5	X	10
Gym	Gym	1	1021	66.9	L	53.1		438		3.8		12.6	X	30-50
Boiler Room	Boiler Room	1	1022	67.6	L	54.0		453		3.3		4.8	X	30
Kitchen	Kitchen	1	1023	67.9	L	53.5		451		3.5		37.9	X	50
Kitchen	Storage	1	1024	68.1	L	53.3		448		3.6		20.9		5
Supply	Storage	1	1025	67.2	L	50.4		452		3.8		30.0		10
Vault	Storage	1	1026	66.9	L	54.2		404		3.6		15.3		10
Recruiter's Office	Office	1	1027	67.3	L	55.5		442		3.4		42.2		30-50
Office 3	Office	1	1028	67.5	L	56.8		445		3.3		33.3		30-50
Office 2	Office	1	1029	67.8	L	56.0		446		3.4		56.6		30-50
Drill Hall	Drill Hall	2	1030	68.5		53.8		806		3.6		20.4	X	50
Men's Latrine	Latrine	1	1031	68.7		52.7		811		3.3		12.1		5
Men's Shower	Shower	1	1032	68.7		53.1		724		3.4		12.8		5
Janitor's Closet	Storage	1	1033	68.9		52.8		750		3.7		13.9	X	30
Women's Latrine	Latrine	1	1034	69.4		52.6		856		3.3		8.0		5
Hazmat Storage	Storage	1	1035	69.1		49.2		491		3.5		31.0		30

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Vergennes	IAQ								Light		
Date	10/19/2012	Inspector	[redacted]	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Vergennes RC			Serial Number		7565x1228004						Serial Number		K040084EL
Weather Conditions	Rainy			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Supply Closet	Supply/Storage	1	1036	68.5		48.5		531		3.8		29.1		5
Cold Storage	Storage	var										2.8	X	5
Kitchen Storage	Storage	var										32.6		5

BEST AVAILABLE COPY

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVS-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVS-SI (40-5f) 29 March 2004

MEMORANDUM FOR VTARNG, Waterbury Readiness, ATTN: SFC Non-Responsive
Non-Responsive 294 Armory Drive, Waterbury, VT 05676-1308

SUBJECT: Baseline Survey Report

1. I have enclosed the industrial hygiene survey report completed by Shaw Environmental, Incorporated.

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

Non-Responsive
Regional Industrial Hygienist

Encl

CF: SOHO, MAJ Non-Responsive
SHOM, LTC

BEST AVAILABLE COPY

MEDICAL RECORD – SUPPLEMENTAL MEDICAL DATA

For use of this form, see AR 40-66; the proponent agency is the Office of The Surgeon General.

REPORT TITLE	OTSG APPROVED (Date)
WORKERS' OCCUPATIONAL WORKSITE SAMPLING DATA RECORD	

DIRECTORATE Waterbury Armory **BLDG/ROOM** Waterbury
SPECIAL STUDY/REPORT NUMBER Vermont National Guard Study
JOB DESCRIPTION/SERIES Military/Administrative Operations
SAMPLING DATE July 22, 2003

EXPOSURE MONITORED	TYPE SAMPLE*	PERMISSIBLE EXPOSURE LIMIT	SAMPLING RESULT	CALCULATED TWA	EXPOSURE CATEGORY**
1. Lead	P	0.05 mg/m^3	<0.005	<0.005	1
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

*TYPE OF SAMPLE: G=General Area Sample
P=Personal Sample Collected in the Breathing Zone of the Worker.
R=Personal Sample Collected on another worker, but representative of expected exposure for this worker.

**EXPOSURE CATEGORY
1. Measured Exposure levels are below permissible exposure limit.
2. Measured Exposure levels are close to permissible exposure limits: See Comments.
3. Measured Exposure levels are above permissible exposure limits: See Comments.

COMMENTS:

NOTE: REFER TO THE SPECIAL STUDY OR REPORT REFERENCED FOR DETAILS OF SAMPLING AND RESULTS.

(Continue on reverse)

PREPARED BY (Signature & Title)	DEPARTMENT/SERVICE/CLINIC	DATE
Non-Responsive ndustrial Hygienist	INDUSTRIAL HYGIENE SECTION	8/14/2003

PATIENT'S IDENTIFICATION (*For typed or written entries give: Name --last, first, Middle; grade; date; hospital or medical facility*)				
NAME: Non-Responsive SFC : 7/22/2003		HISTORY/PHYSICAL		FLOW CHART
SSN: Non-Responsive		OTHER EXAMINATION OR EVALUATION		OTHER (SPECIFY)
UNIT PHONE NO: 802-241-2570		DIAGNOSTIC STUDIES		TREATMENT

DA FORM 1 MAY 78 4700

HSXR-APG-Z OP 32 1 Jan 90

Shaw Environmental, Inc.
312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Waterbury Readiness Center – Waterbury, Vermont

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

22 March 2004

National Guard Armory
Waterbury Readiness Center – Waterbury, Vermont

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

22 March 2004

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. (Shaw) was contracted to perform an industrial hygiene evaluation for the Waterbury Readiness Center in Waterbury, Vermont. Non-Responsive performed the evaluation on 22 July 2003 and 8 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 Range
- 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
- Water Damage
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs

- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at five locations in armory. It is recommended that these surfaces and the areas immediately around these surfaces 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall. Areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.
- 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.
- Visual mold was observed in the armory. The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.
- Indoor air quality measurements revealed that the humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the supply room, where there is a minimal fresh air supply, and the three front offices. Fans could be used to circulate air in these areas.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in some areas; therefore consideration should be given to providing more lighting in these areas. 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.

- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level. These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Waterbury Readiness Center in Waterbury, Vermont. Non-Responsive performed the evaluation on 22 July 2003 and 8 October 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 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 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/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 hall. If there were any positive results from the drill floor/assembly hall, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at five locations. One sample collected from the drill hall floor had a lead concentration of 300 $\mu g/ft^2$. Four samples in the assembly/drill hall (soda machine top surface, locker #82 top surface, fire alarm control box top surface, and locker #95 top surface) had lead concentrations of 240, 670, 360 and 410 $\mu g/ft^2$, respectfully. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the assembly hall and converted firing range. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix E) states that all areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.

2.1.2 Air Sampling for Lead

Breathing zone air sampling was conducted on one (1) full-time building occupant. (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 actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory at two locations; the foyer wall and wall opposite the foyer wall. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or 0.5 percent by weight. Bulk sampling results revealed lead at levels below 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. Materials suspected of containing asbestos were observed. The suspected asbestos-containing material was insulation in the boiler room (approximately 33 linear feet). The condition of the boiler room insulation material was considered good (no rips, tears, or other damage).

An operation 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. Water damage and visible mold were observed at the armory during the 22 July 2003 site visit. Water damage and visible mold were observed on the foyer wall and wall opposite of the foyer wall. Please note that the water damage was repaired prior to the 10 October 2003 visit. The source of the water damage was from a pipe leak.

The area where the mold is located should be thoroughly cleaned with 0.5% sodium hypochlorite solution (1 part household bleach to nine parts water) or equivalent in order to eliminate the potential mold/indoor air quality problem. In addition, the source of the mold should be identified and actions taken to eliminate the source of the mold.

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

2.3.2 Indoor Air Quality

Interviews with employees revealed ventilation as an indoor air quality concern at the armory, specifically in the supply room, where there is minimal fresh air, and in the three front offices. In addition, measurements for humidity revealed a level that exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory. In addition, fans could be used to circulate air in the supply room and offices

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 HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 some areas, including the supply room (office area), kitchen, and men's latrine.

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 converted range. The space is used as storage. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- exhaust ventilation system at 3700 micrograms lead per square foot ($\mu g/ft^2$);
- floor at < 110 $\mu g/ft^2$;
- floor outside the range at < 110 $\mu g/ft^2$;
- stored item at 930 $\mu g/ft^2$; and
- light fixture at 250 $\mu g/ft^2$.

The lead levels at three of the locations were above 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). These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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 lead-based paint, water damage, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, visible mold, indoor air quality, surface lead contamination in the converted firing range, 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
Waterbury, Vermont
Dates of Sampling: 22 July 2003 and 8 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTWAT203-1	Drill Floor -- On Floor (See Building Layout Appendix B)	120
VTWAT203-2	Drill Floor – On Floor (See Building Layout – Appendix B)	300
VTWAT203-3	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTWAT203-4	Drill Floor · On Floor (See Building Layout · Appendix B)	< 110
VTWAT203-5	Drill Floor – On Floor (See Building Layout – Appendix B)	< 110
VTWAT203-6	Field Blank	< 12 µg
VTWAT203-13	Classroom · · table top	< 110
VTWAT203-14	Kitchen · refrigerator top surface	< 110
VTWAT203-15	Supply Office filing cabinet top surface	< 110
VTWAT203-16	Administrative Office · desktop	< 110
VTWAT282-1	Assembly Room -- soda machine top surface (See Building Layout -- Appendix B)	240
VTWAT282-2	Assembly Room locker #82 top surface (See Building Layout · · Appendix B)	670
VTWAT282-3	Assembly Room · · locker #49 top surface (See Building Layout – Appendix B)	130
VTWAT282-4	Assembly Room · · fire alarm control box top surface (See Building Layout – Appendix B)	360
VTWAT282-5	Assembly Room – locker #95 top surface (See Building Layout – Appendix B)	410
VTWAT282-6	Field Blank	0.38 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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Waterbury, Vermont
Date of Sampling: 22 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTENO196-A1	Non-Responsive	1301-1420/79	2.4671	194.90	<0.005
VTENO196-A2	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.

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Table 3
Peeling Paint Sampling for Lead
National Guard Armory
Waterbury, Vermont
Date of Sampling: 22 July 2003

Sample Number	Location	Results, % By Weight
VTWAT203-B1	Foyer wall	0.0040
VTWAT203-B2	Wall opposite of foyer wall	0.0057

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
Waterbury, Vermont
Date of Sampling: 22 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor	2	514	69.9	74.8
Outdoors	0	419	73.1	85.6

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.

Table 5

Illumination Readings

National Guard Armory

Waterbury, Vermont

Date of Sampling: 22 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Supply Room (office area)	24.1-54.3	70	No
Kitchen	14.0-49.9	70	No
Kitchen storage	38.1-85.3	30	Yes
Classroom	10.2-113	70	Some areas
Office	45.7-88.3	70	Some areas
Administrative Office	60.2-120.3	70	Some areas
Men's Latrine	5.3-17.5	40	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

Waterbury, Vermont

Date of Sampling: 22 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTWAT203-7	Exhaust Ventilation System	3700
VTWAT203-8	Floor	< 110
VTWAT203-9	Floor Outside the Range	< 110
VTWAT203-10	Stored Item	930
VTWAT203-11	Light Fixture	250
VTWAT203-12	Blank	< 12 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.

Appendix A
HHIM Data Form(s)

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.
	Waterbury Armory Vermont ARNG	Waterbury

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative Operations / ADO

SURVEY DATE	EVALUATOR (Initials)
22 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
ARMY NATIONALGUARD	XX	Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802 241 2570	Battery A 1BN (155mm SP) 86 Field Artillery	4	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
0	4	0	0	0

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			EAR PLUGS			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
PAVDTXXXX	Video Display Terminal	3-low	D Uncontrolled Physical
1332-21-4	Asbestos (other)	3-low	C Uncontrolled Respiratory
7439-92-1	Lead, Inorganic dust and fumes, as Pb	2-moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive		R	M	Non-Responsive	MIL
		W			
		J			
		E			

SECTION 6. COMMENTS

___No comments. See attached sheet

Survey was conducted by Michele Serwan. Building contains 4 (four) full time military employees. Employees perform mainly Administrative functions. Please note mold was observed in the building.

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.

BATTERY A 1BN(155mmSP) 86 Field Artillery
VERMONT ARMY NATIONAL GUARD
294 Armory Drive
Waterbury, VT 05676-1308

WPXBA0 21JUL2003

MEMORANDUM FOR RECORD

SUBJECT: Full Time Support Personnel

1. The following soldiers are assigned to the above facility as their home station:

SFC [redacted] eadiness NCO [redacted]
SFC [redacted] Recruiter
SSG [redacted] t Supply NCO
SSG [redacted] it Training NCO

FOR THE COMMANDER

[redacted]
SFC, VTARNG
Readiness NCO

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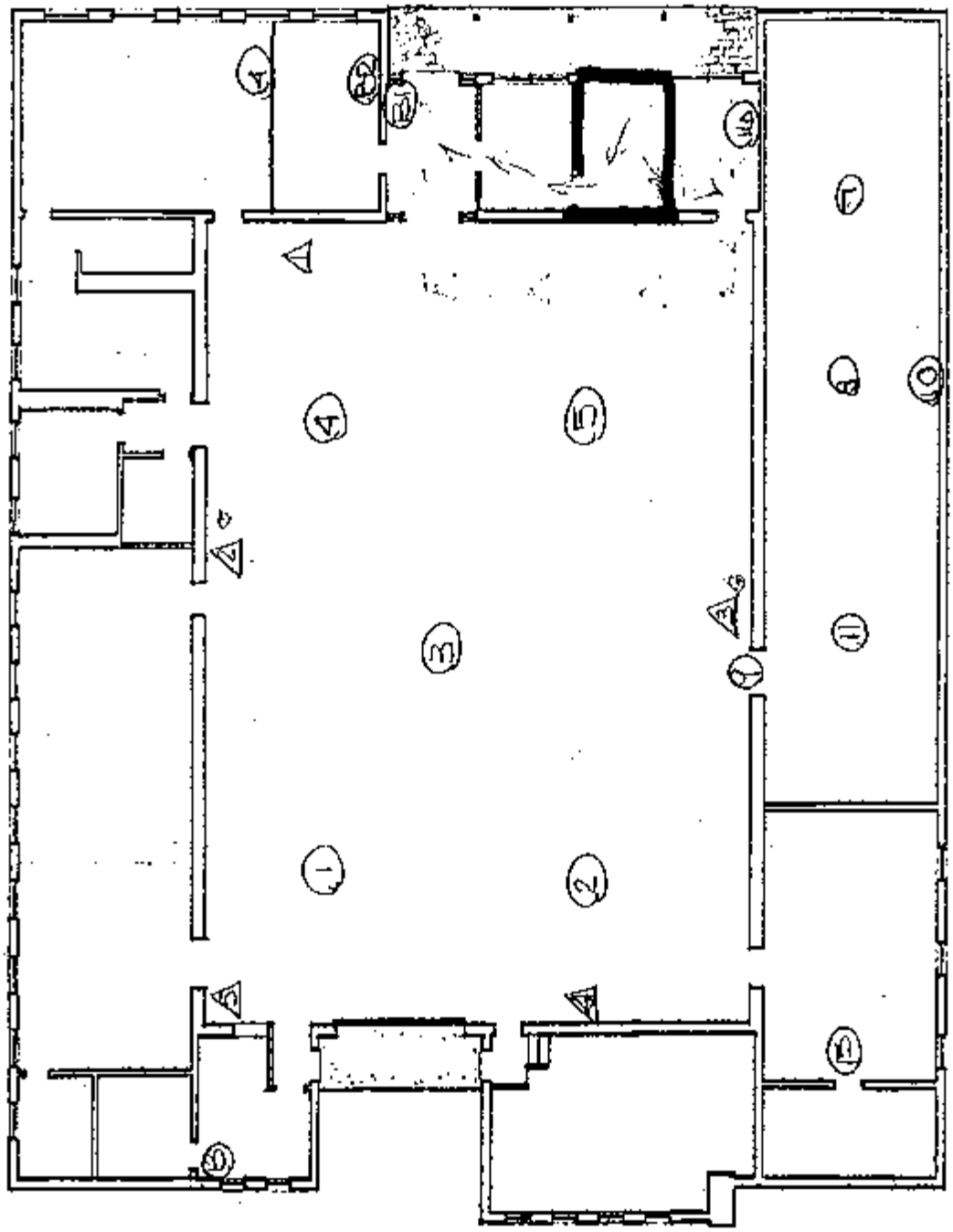
Appendix B
Building Layout

FLOOR PLAN
WATERBURY ARMORY
SCALE: 1" = 20' | 28/OCT/03



○ Sample date 22 July 2003
△ Sample date 8 October 2003

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:**	VTWAT203	**Chain Of Custody:**	115814
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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
0359537	VTWAT203-1	Flame	Wipe	****	0.111	108.00	ug/ft²		120	ug/ft²	
0359538	VTWAT203-2	Flame	Wipe	****	0.111	108.00	ug/ft²		300	ug/ft²	
0359539	VTWAT203-3	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359540	VTWAT203-4	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359541	VTWAT203-5	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359542	VTWAT203-6	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0359543	VTWAT203-7	Flame	Wipe	****	0.111	108.00	ug/ft²		3700	ug/ft²	
0359544	VTWAT203-8	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359545	VTWAT203-9	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0359546	VTWAT203-10	Flame	Wipe	****	0.111	108.00	ug/ft²		930	ug/ft²	
0359547	VTWAT203-11	Flame	Wipe	****	0.111	108.00	ug/ft²		250	ug/ft²	
0359548	VTWAT203-12	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	

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

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWAT203	**Chain Of Custody:**	115814
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	05-Aug-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

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] Non-Responsive

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

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWAT203	**Chain Of Custody:**	115918
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/18/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	18-Aug-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
0362683	VTWAT203-13	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362684	VTWAT203-14	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362685	VTWAT203-15	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	
0362686	VTWAT203-16	Flame	Wipe	****	0.111	108.01	ug/ft²	<	110	ug/ft²	

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]

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWAT282	**Chain Of Custody:**	118708
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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 (ft^2)	Reporting Limit		Final Result		Comments
0402856	VTWAT282 -1	Furnace	Wipe	****	0.111	67.51	ug/ft^2	240	ug/ft^2	
0402857	VTWAT282 -2	Furnace	Wipe	****	0.111	67.51	ug/ft^2	670	ug/ft^2	
0402858	VTWAT282 -3	Furnace	Wipe	****	0.111	33.75	ug/ft^2	130	ug/ft^2	
0402859	VTWAT282 -4	Furnace	Wipe	****	0.111	67.51	ug/ft^2	360	ug/ft^2	
0402860	VTWAT282 -5	Furnace	Wipe	****	0.111	67.51	ug/ft^2	410	ug/ft^2	
0402861	VTWAT282 -6	Furnace	Wipe Blank	****	N/A	0.30	ug	0.38	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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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.

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Non-Responsive

Analyst

Non-Responsive

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
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m^3
VTWIL197-A2	03-22320	149.76	ND	<0.007
VTWIL197-A3	03-22321	0	ND	-
VTSWA196-A1	03-22322	149.24	ND	<0.007
VTSWA196-A2	03-22323	0	ND	-
VTSTA196-A1	03-22324	165.20	ND	<0.006
VTSTA196-A2	03-22325	151.74	ND	<0.007
VTSTA196-A3	03-22326	0	ND	-
VTWAT203-A1	03-22328	194.90	ND	<0.005
VTWAT203-A2	03-22329	0	ND	-
VTGOS202-A1	03-22332	175.30	ND	<0.006
VTGOS202-A2	03-22333	0	ND	-
VTMOR203-A1	03-22335	346.43	ND	<0.003
VTMOR203-A2	03-22336	348.65	ND	<0.003
VTMOR203-A3	03-22337	0	ND	-
VTGRE197-A1	03-22340	240.55	ND	<0.004
VTGRE197-A2	03-22341	250.76	ND	<0.004
VTGRE197-A3	03-22342	0	ND	-
VTAAS209-A1	03-22343	748.92	ND	<0.001
VTAAS209-A2	03-22344	507.55	ND	<0.002
VTAAS209-A3	03-22345	0	ND	-
	Prep Blank 2		ND	
% Recovery	LCS 3		96.	
% Recovery	LCS 4		95.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-B1 through VTMCR203-B2
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22312 through 03-22339
Sample Receipt Date:	07/28/2003
Preparation Date:	07/29/2003
Analysis Date:	07/31/2003

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.

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Non-Responsive
Analyst

Non-Responsive
Reviewer

CINCINNATI OFFICE
4388 GLENDALE-MILFORD ROAD
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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
VTCAM205-B1	03-22312	160.	0.016
VTWIN202-B1	03-22315	11000.	1.1
VTENO196-B1	03-22318	96000.	9.6
VTSTA197-B1	03-22327	1800.	0.18
VTWAT203-B1	03-22330	40.	0.0040
VTWAT203-B2	03-22331	57.	0.0057
VTMOR203-B1	03-22338	3900.	0.39
VTMOR203-B2	03-22339	11000.	1.1
	Prep Blank	ND	
% Recovery	LCS	87.	
% Recovery	03-22327 MS	* 0.	
% Recovery	03-22327 MSD	* 4.	
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.
* Low recovery due to non-homogeneous sample matrix.

Non-Responsive

Analyst

Non-Responsive

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** WAT
Date: 203

Sample 1

Sample Number: VTWAT203-A1
Pump: 647615

	Pre Flow Rate	Post Flow Rate
	2.5	2.437
	2.493	2.441
	2.487	2.452
	2.481	2.446
Average	**2.490**	**2.444**

Average Pre and Post **2.4671**

Time 1	13:01
Time 2	14:20
Total Time Sampled	**1:19**
Minutes Sampled	79.00

Volume **194.90 Liters**

Sample 2

Sample Number: N/A
Pump: N/A

	Pre Flow Rate	Post Flow Rate
	N/A	N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
Average	**N/A**	**N/A**

Average Pre and Post **N/A**

Time 1	N/A
Time 2	N/A
Total Time Sampled	**N/A**
Minutes Sampled	N/A

Volume **N/A** 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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Rex W. Morse Readiness Center
294 Armory Drive
Waterbury, VT 05676

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 19, 2012

AEI Project #: J12-685 3M VT Rex W. Morse RC

_____

Non-Responsive, **DrPH, CIH**
Industrial Hygienist

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Rex W. Morse Readiness Center

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Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Rex W. Morse Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Rex W. Morse Readiness Center located at 294 Armory Drive, Waterbury, VT 05676. Non-Responsive , DrPH, CIH performed the evaluation on October 19, 2012. The point of contact for the facility was SFC Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. One small area of peeling paint was observed in the Supply/Storage room on the north concrete masonry unit (CMU) wall between the fire extinguisher and the former bullet trap at about four feet above the finished floor. There was less than one square foot of damaged paint. A paint chip was collected for analysis. The sample contained lead at a concentration of 0.0066% lead and is not considered lead-based paint.

Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for a sample collected from the wall mounted diffuser located in the locker room (280 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. No significantly damaged, suspect asbestos-containing material was observed. Some damaged floor tile with exposed mastic was observed in the kitchen. The area of damage is limited to less than one square foot. The boiler room was abated when a new boiler was installed.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No evidence of wet areas or mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas including the: classroom, women's latrine, janitor's closet, office, gym, kitchen, boiler room, maintenance storage, supply room, locker storage, and entry vestibule. The illumination measurements indoors ranged from 3.3 foot candles (fc) to 52.4 fc.

Indoor Air Quality: Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 64.8 to 68.9° F and 54.4 to 61.3% Rh. Temperatures were just below the lower end of the winter temperature range for thermal comfort in all but four of the locations monitored. Relative humidity exceeded 60% (60.1 to 61.3) in three rooms in the building. The outdoor

temperature and relative humidity was 60.3° F and 67.8% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) ranged from 522 to 753 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange. Indoor concentrations of carbon monoxide (CO) ranged from 3.5 to 4.2 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

The new exhaust fan in the men's latrine does not function and there are odor and indoor air quality complaints during drill weekends when the unit is at capacity.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available.

The results of the evaluation indicated few concerns at the facility. Overall, the Rex W. Morse Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Rex W. Morse Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Rex W. Morse Readiness Center located at 294 Armory Drive, Waterbury, VT 05676. Non-Responsive, DrPH, CIH performed the evaluation on October 19, 2012. The point of contact for the facility was SFC Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Rex W. Morse Readiness Center was built in the 1950's. The readiness center is staffed by three administrative personnel. The operations conducted at the facility include training and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Rex W. Morse Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Rex W. Morse Readiness Center consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility. The unit trains soldiers on the M119 Howitzer.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility. The exhaust fan in the men's latrine does not function and there are odor and indoor air quality complaints during drill weekends when the unit is at capacity.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. One small area of peeling paint was observed in the Supply/Storage room on the north concrete masonry unit (CMU) wall between the fire extinguisher and the former bullet trap at about four feet above the finished floor. There was less than one square foot of damaged paint. A paint chip was collected for analysis. The sample contained lead at a concentration of 0.0066% lead and is not considered lead-based paint.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected by wiping a Ghost Wipe over a measured area. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA Analytical for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for the sample collected from the wall mounted diffuser located in the locker room (280 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Rex W. Morse Readiness Center on October 19, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft^2)*
WRC-1	Assembly Room Floor 22' South of North Wall, 5' East of the number 2 stenciled on the floor	100 cm^2	<110
WRC-2	Assembly Room Diffuser on wall to Boiler Room	17.5" x 1.5"	190
WRC-3	Assembly Room Top of Locker South Wall, 15' East of West Wall	3" x 36"	21

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Rex W. Morse Readiness Center

Table 1 – Results of Dust Wipe Sampling for VT ARNG Rex W. Morse Readiness Center on October 19, 2012.

Wipe Sample Number	Sample Location	Wipe Dimensions	Lead (µg/ft²)*
WRC-4	Assembly Room Floor 8' North of South at Double Doors to Supply Room	100 cm²	<110
WRC-5	Assembly Room Top of Drinking Water Fountain	100 cm²	<110
WRC-6	Supply Room Floor East of Vault Door, 7' North of South Wall	100 cm²	<110
WRC-7	Kitchen Window Sill West Wall, North Window Sill on South End	100 cm²	<110
WRC-8	Supply/Locker Room (Former Firing Range) Floor South Wall	100 cm²	<110
WRC-9	Supply/Locker Room (Former Firing Range) Top of Light Fixture First Fixture East of Caged Supply Storage	9" x 5"	<38
WRC-10	Supply/Locker Room (Former Firing Range) Top of Locker #36	3" x 36"	33
WRC-11	Supply/Locker Room (Former Firing Range) Floor in Corridor Between Assembly Hall Lockers 2' South of North Wall, 12' East of Door to Assembly hall	100 cm²	<110
WRC-12	Supply/Locker Room (Former Firing Range) Diffuser on North Wall	1" x 15.75"	**280**
WRC-13	Supply Locker Floor Bullet Trap	100 cm²	120
WRC-14	Office 3, Window Sill on East Wall	100 cm²	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). No significantly damaged, suspect asbestos-containing material was observed. Some damaged floor tile with exposed mastic was observed in the kitchen. The area of damage is limited to less than one square foot. The boiler room was abated and a new boiler was installed. Floor tile and mastic remains in the building. These asbestos-containing materials were in good condition.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or visible mold growth was observed.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping appeared to be acceptable overall.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in a few areas including the: classroom, women's latrine, janitor's closet, office, gym, kitchen, boiler room, maintenance storage, supply room, locker storage, and entry vestibule. The illumination measurements indoors ranged from 3.3 foot candles (fc) to 52.4 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7656x, factory calibrated in July, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity

Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 64.8 to 68.9° F and 54.4 to 61.3% Rh. Temperatures were just below the winter temperature range for thermal comfort in all but four of the locations monitored. Relative humidity was just above 60% (60.1-61.3%) in three locations. The outdoor temperature and relative humidity was 60.3° F and 67.8% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 522 to 753 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 3.5 to 4.2 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available. MSDS were last updated in April of 2012.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the Rex W. Morse Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

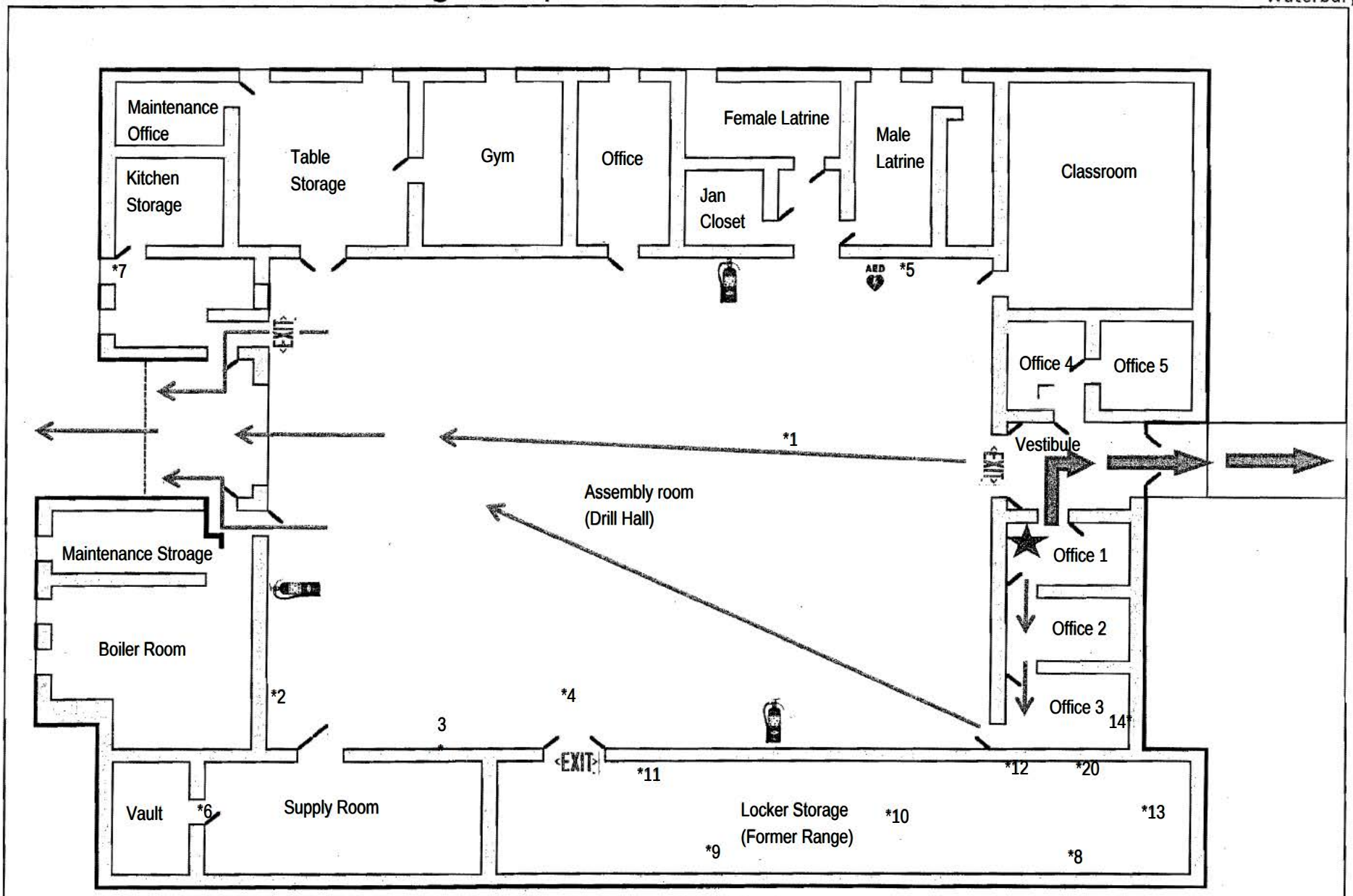
1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

19. National Fire Protection Association (NFPA) 70: National Electrical Code (NEC) 2011.
20. National Guard Pamphlet (NG PAM) 420-15, Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges, November 3, 2006.

Appendix A
Building Layout

Emergency Evacuation Plan

Waterbury, VT



Legend:

- Fire Extinguisher
- Main Rout
- Your Location
- AED Machine
- Alternet Rout
- EXIT Exit Sign

Sample Location Plan and Room Location Plan
Industrial Hygiene Survey
October 19, 2012
Key: *## Lead Sample

Floor Plan
Waterbury Armory
3/30/2010

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	VT ARNG 3M IH Surveys	**Chain Of Custody:**	514298
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Rex W. Morse, Waterbury, VT	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	10/30/2012 **Report Date:** 10/31/2012
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
13008757	WRC-1	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008758	WRC-2	Flame	Wipe	****	0.182	66	ug/ft²	35	190	ug/ft²	
13008759	WRC-3	Flame	Wipe	****	0.750	16	ug/ft²	16	21	ug/ft²	
13008760	WRC-4	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008761	WRC-5	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008762	WRC-6	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008763	WRC-7	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008764	WRC-8	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008765	WRC-9	Flame	Wipe	****	0.313	38	ug/ft²	<12	<38	ug/ft²	
13008766	WRC-10	Flame	Wipe	****	0.750	16	ug/ft²	25	33	ug/ft²	
13008767	WRC-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008768	WRC-12	Flame	Wipe	****	0.109	110	ug/ft²	31	280	ug/ft²	
13008769	WRC-13	Flame	Wipe	****	0.108	110	ug/ft²	13	120	ug/ft²	
13008770	WRC-14	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13008771	WRC-20	Flame	Paint Chip	****	N/A	0.0066	%Pb		0.019	%Pb	

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:**	VT ARNG 3M IH Surveys	**Chain Of Custody:**	514298
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Rex W. Morse, Waterbury, VT	**Date Submitted:**	10/24/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	10/30/2012 **Report Date:** 10/31/2012

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.

Analyst: 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) 514298

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: VTARNG 3M Industrial Hygiene Surveys
2. Job Location: Rex W. Morse, Waterbury, VT
3. Job #: PO #: W912K6-09-A-0003
4. Contact Perso[redacted]
5. Submitted by[redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

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

NORMAL BUSINESS HOURS
❑ Immediate ❑ 3 Day ❑ Results Required By Noon
❑ Next Day ☒ 5 Day + Date Due: 10/3/12
❑ 2 Day

REPORT TO:
☒ Include COC/Field Data Sheets with Report
☒ Email: mtwilley@ariaenviro.com
❑ Fax: shirley.chapman1@us.army.mil
❑ Verbals: ken.forsythe@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)
*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
☒ Pb Paint Chip 1 (QTY)
☒ *Pb Dust Wipe (wipe type GHOST) 14 (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)

SAMPLE INFORMATION				ANALYSIS								MATRIX				CLIENT CONTACT (LABORATORY STAFF ONLY)
CLIENT ID #	SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	
WRC-1 through WRC-14							✓			✓	✓					Date/Time: Contact: By:
WRC-20							✓									
	SEE ATTACHED FIELD DATA SHEETS															Date/Time: Contact: By:
																Date/Time: Contact: By:

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 10/24/12 @ Via: By (Print): [redacted] Sign: [redacted]
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
Loading Room

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10-19-12

Job Site: Rex W. Morse, Waterbury, VT

Project No.: J12-685

Inspector: Non-Responsive

Sample No.	Sample Type	Sample Location	Dimensions (Area)
WRC-1	Pb Wipe	~~Assembly~~ Floor 22.5' S of N wall 5' E of number 2 stenciled on floor	100 cm²
WRC-2	Pb Wipe	Assembly Room Diffuse (not functioning) on wall to Boiler Room	17.5" x 1.5"
WRC-3		Assembly Room ~~Floor~~ Top of Locker S wall 15' E of W wall	3" x 36"
WRC-4		Assembly Room Floor 8' N of S at Double doors to Supply Room	100 cm²
WRC-5		Assembly Room Top of drinking water fountain	100 cm²
WRC-6		Supply Room Floor 1.5' E of vault door, 7' N OF S	100cm²
WRC-7		Kitchen window sill west wall N window sill, S end	100cm²
WRC-8		Supply/Locker Floor S wall	100cm²
WRC-9		Supply/Locker Top of light fixture 1st fixture E of Classified Supply stg	9"x5"
WRC-10		Supply/Locker Top of locker #36	3"x36"
WRC-11		Supply/Locker Floor in corridor btw Assembly Hall & Lockers 2' S OF N, 12' E OF door to Ass. Hall	100cm²
WRC-12		Supply/Locker Floor register on N wall	1"x15.75"
WRC-13		Supply Locker Floor Bullet trap pit	100cm²
WRC-14	√	~~Supply Locker~~ window sill on E wall Office 3	100cm²

Aria Environmental, Inc

ASBESTOS BULK AND PAINT CHIP SAMPLING SURVEY SHEET

Inspector: Non-Responsive

License/Accreditation No.:

Witnessed By:

Date Collected: 10-19-12

Job Site: Waterbury, VT

Project No.: J12-685

Sample No.	Type of Material Sampled	Floor	Functional Area	Sample Location	Comments
WRC-20	Paint White Conc Wall	1	Supply/Storage	North wall Between Fire Extinguisher & former bullet trap ~4' AFF	>1 ft. Damage

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Appendix C
Photo Documentation

VT Rex W. Morse RC

Photo 1: Main entrance to Rex W. Morse Readiness Center.

Photo 2: Main entrance to Rex W. Morse Readiness Center.

Photo 3: Assembly Hall with M119 Howitzers.

Photo 4: Supply/Locker Room.

VT Rex W. Morse RC

Photo 5: Kitchen.

Photo 6: Damaged floor tile with exposed mastic in kitchen.

Photo 7: Kitchen.

Photo 8: View of Assembly Hall from loading dock.

VT Rex W. Morse RC

Photo 9: Renovated boiler room.

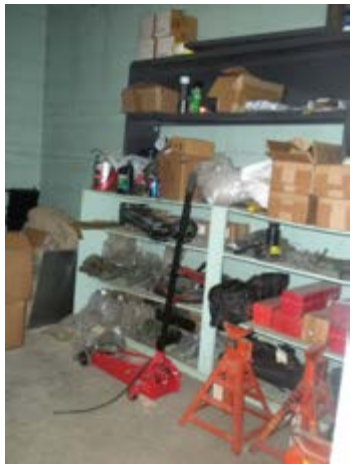

Photo 10: Maintenance Storage.

Photo 11: Flammable materials storage cabinets with MSDS book.

Photo 12: View inside flammable materials storage cabinet.

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Rex Morse	IAQ							Light		
Date	10/19/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X					Instrument		Cal-Light 400L
Facility Description	Rex W. Morse RC			Serial Number		7575x1228004					Serial Number		K040084EL
Weather Conditions	Rainy			Last Calibration		Jul-12					Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Classroom	Classroom	var	1433	67.4	X	57.4		731		4.0		17.8	X	30-50
Men's Latrine	Latrine	var	1439	67.1	X	59.5		643		4.2		9.5		5
Women's Latrine	Latrine	var	1440	66.8	X	61.3	X	621		4.0		3.3	X	5
Janitor's Closet	Storage	var	1441	67.0	X	60.1	X	633		3.8		15.0	X	30
Assembly Hall	Assembly Hal	var	1442	67.2	X	58.5		635		3.8		45.4		30-50
Office	Office	1	1443	67.4	X	58.1		630		3.8		21.3	X	30-50
Gym	Gym	var	1444	67.7	X	57.5		614		4.0		12.5	X	30
Table Storage	Storage	var	1445	67.4	X	57.0		611		3.8		29.9		10
Maintenance Office	Office	1	1446	67.2	X	56.6		603		3.8		41.1		30-50
Kitchen	Storage	1	1447	67.1	X	57.8		600		3.8		37.6		5
Kitchen	Kitchen	var	1448	67.1	X	59.0		594		3.8		44.0	X	50
Boiler Room	Bolier Room	1	1449	64.9	X	59.1		522		3.7		4.9	X	30
Maintenance Storage	Storage	1	1450	64.8	X	60.1	X	527		3.8		7.0	X	30
Vault	Storage	1	1451	65.1	X	54.4		665		3.6		26.1		10
Supply	Office/Storage	2	1452	66.1	X	56.6		650		3.5		27.6	X	30
Locker Storage	Storage	var	1453	66.6	X	57.7		590		3.7		7.4	X	10
Office 3	Office	1	1454	67.3	X	59.1		633		3.6		47.1		30-50
Office 2	Office	1	1455	68.1		58.6		647		3.7		52.4		30-50
Office 1	Office	1	1456	68.1		58.2		645		3.6		48.0		30-50
Entry Vestibule	Corridor	1	1457	67.8	X	57.4		658		3.8		5.8	X	10
Office 4	Office	1	1457	68.6		56.9		753		3.8		49.6		30-50

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Rex Morse	IAQ								Light		
Date	10/19/2012	Inspector	[redacted]	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Rex W. Morse RC			Serial Number		7575x1228004						Serial Number		K040084EL
Weather Conditions	Rainy			Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Office 5	Office	1	1458	68.9		55.9		681		3.8		41.6		30-50
Outdoors	Outdoors	0	1459	60.3		67.8		434		4.1		38.2		N/A

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Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Westminster Readiness Center – Westminster, Vermont

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

01 March 2004

National Guard Armory
Westminster Readiness Center – Westminster, Vermont

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

01 March 2004

Prepared by: Non-Responsive _____
Industrial Hygienist

Reviewed by: Non-Responsive _____
Business Line Manager

BEST AVAILABLE COPY

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Executive Summary

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Westminster Readiness Center in Westminster, Vermont Non-Responsive Non-Responsive performed the evaluation on 4 August 2003 and 7 October 2003. The point of contact at the readiness center was 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 Range
- 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
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at one location in armory. It is recommended that this surface and the area immediately around this surface 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the assembly hall. Areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.
- 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 two locations at the armory. The sources of the water damage were likely from a roof leak on the first floor and building foundation breach/high water table concerning the basement wall. The sources of the water damage should be confirmed and actions taken to eliminate the sources in order to prevent the possibility of mold growth that may lead to indoor air quality problems.
- Indoor air quality measurements revealed that the humidity and temperature on the first floor at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory to control the humidity. Window air-conditioning units and/or fans can be used for cooling purposes and to circulate air.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in some areas; therefore consideration should be given to providing more lighting in these areas. 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.

- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at all of the locations sampled. These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Westminster Readiness Center in Westminster, Vermont. Non-Responsive Non-Responsive performed the evaluation on 4 August 2003 and 7 October 2003. The point of contact at the readiness center was 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 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 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/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 hall. If there were any positive results from the drill floor/assembly hall, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at one location. One sample collected from the assembly hall (heater unit flap surface) had a lead concentration of 1000 $\mu g/ft^2$. It is recommended that this surface and the immediate area around the surface be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the assembly hall. Please note that the *Recommendations for Surface Lead Dust in*

Armories (Appendix E) states that all areas with lead concentrations above 40 $\mu g/ft^2$ that will be accessible to children should be 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.

2.1.2 Air Sampling for Lead

Breathing zone air sampling was conducted on one (1) full-time building occupant. (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 actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory at one location; the converted firing range/storage room wall. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or 0.5 percent by weight. Bulk sampling results revealed lead at that location was below 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. Materials suspected of containing asbestos were observed. The suspected asbestos-containing material was insulation in the boiler room (approximately 7.5 linear feet). The condition of the boiler room insulation material was considered good (no rips, tears, or other damage).

An operation 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. Mold was not observed, however water damage was observed at the armory. Water damage was observed as a stained ceiling tile in the CDR office and stained walls and ceiling in the range room.

The source of the water damage was likely from a roof leak concerning the CDR office stained tile, and a building foundation breach/high water table concerning the Range room damage. The source of the water damage should be confirmed 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 and observation of work activities revealed no ergonomic concerns at the armory.

2.3.2 Indoor Air Quality

Interviews with employees revealed ventilation as an indoor air quality concern at the armory. In addition, measurements for humidity and temperature revealed levels that exceeded the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommendations of 60% humidity and 79 degrees Fahrenheit in the summer. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory to control the humidity. Window air-conditioning units and/or fans can be used for cooling purposes and to circulate 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 the HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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. 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 some areas, including the NBC/supply room (office area), locker room, kitchen storage room, storage room and women's latrine.

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 Indoor Firing Range

There is an inactive indoor firing range used as a storage room at the facility; therefore, wipe samples were taken for lead at various locations in or near the range. It should be noted that the room is not occupied by personnel and is infrequently utilized. The results are provided in Table 5. The results revealed lead, with associated concentrations, at the following locations:

- floor outside the range at 1100 micrograms lead per square foot ($\mu g/ft^2$);
- floor at 1900 $\mu g/ft^2$;
- stored item (desktop) at 1300 $\mu g/ft^2$; and
- overhead heater at 3200 $\mu g/ft^2$.

The lead levels at all of these locations were above 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). These areas must be decontaminated by a thorough cleaning until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

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 lead-based paint, visible mold, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, suspected asbestos-containing material, water damage, indoor air quality, surface lead contamination in the converted firing range, 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
Westminster, Vermont
Dates of Sampling: 04 August 2003 and 7 October 2003

Sample Number	Location	Results, µg/ft² *
VTWES216-1	Drill Floor (See Building Layout – Appendix B)	< 110
VTWES216-2	Drill Floor (See Building Layout – Appendix B)	< 110
VTWES216-3	Drill Floor (See Building Layout – Appendix B)	< 110
VTWES216-4	Drill Floor (See Building Layout – Appendix B)	< 110
VTWES216-5	Drill Floor (See Building Layout – Appendix B)	< 110
VTWES216-6	Field Blank	< 12 µg
VTWES216-11	Classroom - table top	13
VTWES216-12	Field Blank	0.3 µg
VTWES216-13	Kitchen – refrigerator top surface	< 2.7
VTWES216-14	Supply Room – printer top surface	18
VTWES216-15	RNCO Office desktop	11
VTWES216-16	CDR Office – desktop	15
VTWES216-17	Weight Room – book shelf	32
VTWES216-18	Field Blank	< 0.3 µg
VTWES281-1	Assembly Room – windowsill (See Building Layout - Appendix B)	7.5
VTWES281-2	Assembly Room – table top (See Building Layout Appendix B)	13
VTWES281-3	Assembly Room - heater unit flap surface (See Building Layout – Appendix B)	1000
VTWES281-4	Assembly Room - soda machine top surface (See Building Layout – Appendix B)	150

* Micrograms lead per square foot

Table 1 Continued
Wipe Sampling for Lead
National Guard Armory
Westminster, Vermont
Dates of Sampling: 08 August 2003 and 7 October 2003

Sample Number	Location	Results, µg/ft² [a]
VTWES281-5	Assembly Room mail slot top surface (See Building Layout - - Appendix B)	65
VTWES281-6	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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Westminster, Vermont
Date of Sampling: 04 August 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTWES216-A1	Non-Responsive	1344-1532/118	2.4945	294.35	<0.003
VTWES216-A2	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
Westminster, Vermont
Date of Sampling: 04 August 2003

Sample Number	Location	Results, % By Weight
VTWES216-B1	Converted Firing Range (Storage Room)	0.0035

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
Westminster, Vermont
Date of Sampling: 04 August 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor – Classroom	1	501	73.6	79.9
Basement	1	521	79.6	72.0
Outdoors	0	431	74.0	85.1

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
Westminster, Vermont
Date of Sampling: 04 August 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Kitchen	51.3-125.3	70	Some Areas
Locker Room	2.1-7.4	40	No
NBC Room/Supply Room (office area)	11.1-67.8	70	No
Weight Room	37-140	70	Some Areas
Classroom	24.3-108	70	Some Areas
Storage room	13.1-23.5	30	No
ISG Office	37.6-132.3	70	Some Areas
Administrative Office	72.1-135.6	70	Yes
Kitchen – storage room	9.8-23.2	30	No
Women's Latrine	11.1-23.2	40	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 ANSI/IES RP-1 and RP-7.

Table 6

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Westminster, Vermont

Date of Sampling: 04 August 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTWES216-7	Floor Outside the Range	1100
VTWES216-8	Floor	1900
VTWES216-9	Stored Item – stored desk	1300
VTWES216-10	Overhead heaters	3200

[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.

Appendix A
HHIM Data Form(s)

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.
	Westminster Armory Vermont ARNG	Westminster

LOCATION/CODE	OPERATION/CODE
Administrative Areas / AA	Administrative Operations / ADO

SURVEY DATE	EVALUATOR (Initials)
04 August 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive

TELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-722-4259	Company B, 2nd Battalion	4	8

NO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
2	2	0	0	0

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			EAR PLUGS			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-low	Uncontrolled D Physical
1332-21-4	Asbestos other	2 moderate	C Uncontrolled Respiratory
7439-92-1	Lead, Inorganic dusts and fumes, as PB	2 moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive		E	M	Non-Responsive	MIL
		F	M		↓
			M		CIV
			M		↓

SECTION 6. COMMENTS

____No comments See attached sheet

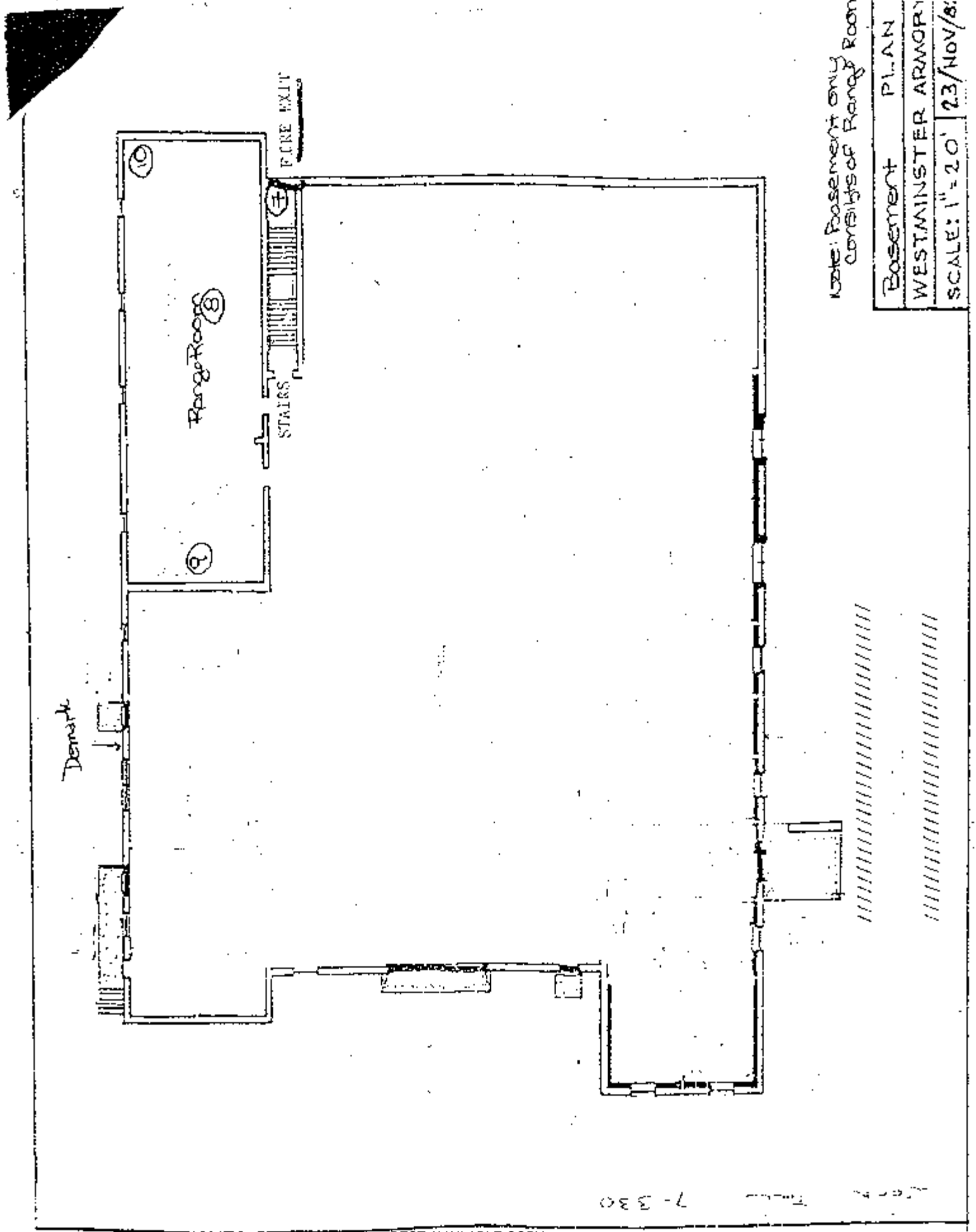
Survey conducted by Michele Seman. Building contains 2 full-time military employees And 2 state employees. Full-time military employees perform mainly administrative functions.

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.

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:**	VTWES216	**Chain Of Custody:**	115914
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	08/15/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	07-01	**Report Date:**	15-Aug-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
0362255	VTWES216-1	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362256	VTWES216-2	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362257	VTWES216-3	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362258	VTWES216-4	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362259	VTWES216-5	Flame	Wipe	****	0.111	108.00	ug/ft²	<	110	ug/ft²	
0362260	VTWES216-6	Flame	Wipe Blank	****	N/A	12.00	ug	<	12	ug	
0362261	VTWES216-7	Flame	Wipe	****	0.111	108.00	ug/ft²		1100	ug/ft²	
0362262	VTWES216-8	Flame	Wipe	****	0.111	108.00	ug/ft²		1900	ug/ft²	
0362263	VTWES216-9	Flame	Wipe	****	0.111	108.00	ug/ft²		1300	ug/ft²	
0362264	VTWES216-10	Flame	Wipe	****	0.111	108.00	ug/ft²		3200	ug/ft²	

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
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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWES281	**Chain Of Custody:**	118701
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/16/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	16-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
0402814	VTWES281 -1	Furnace	Wipe	****	0.111	2.70	ug/ft²	7.5	ug/ft²	
0402815	VTWES281 -2	Furnace	Wipe	****	0.111	2.70	ug/ft²	13	ug/ft²	
0402816	VTWES281 -3	Furnace	Wipe	****	0.111	202.52	ug/ft²	1000	ug/ft²	
0402817	VTWES281 -4	Furnace	Wipe	****	0.111	67.51	ug/ft²	150	ug/ft²	
0402818	VTWES281 -5	Furnace	Wipe	****	0.111	13.50	ug/ft²	65	ug/ft²	
0402819	VTWES281 -6	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] Non-Responsive **Technical Manager:** [redacted]

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AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWES216	**Chain Of Custody:**	118889
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/27/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	27-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
0404038	VTEWS216-11	Furnace	Wipe	****	0.111	2.70	ug/ft²		13	ug/ft²	
0404039	VTEWS216-12	Furnace	Wipe Blank	****	N/A	0.30	ug		0.3	ug	
0404040	VTEWS216-13	Furnace	Wipe	****	0.111	2.70	ug/ft²	<	2.7	ug/ft²	
0404041	VTEWS216-14	Furnace	Wipe	****	0.111	2.70	ug/ft²		18	ug/ft²	
0404042	VTEWS216-15	Furnace	Wipe	****	0.111	2.70	ug/ft²		11	ug/ft²	
0404043	VTEWS216-16	Furnace	Wipe	****	0.111	2.70	ug/ft²		15	ug/ft²	
0404044	VTEWS216-17	Furnace	Wipe	****	0.111	5.40	ug/ft²		32	ug/ft²	
0404045	VTEWS216-18	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]

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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTBEN216-A1 through VTRUT217-A3
P.O. No.:	Not Available
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3834
DCL Sample ID No.:	03-23429 through 03-23442
Sample Receipt Date:	8/8/2003
Preparation Date:	08/11/03
Analysis Date:	08/11/03

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

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
VTBEN216-A1	03-23429	402.71	ND	<0.002
VTBEN216-A2	03-23430	404.73	ND	<0.002
VTBEN216-A3	03-23431	0	ND	-
VTWES216-A1	03-23437	294.35	ND	<0.003
VTWES216-A2	03-23438	0	ND	-
VTRUT217-A1	03-23440	420.05	ND	<0.002
VTRUT217-A2	03-23441	412.99	ND	<0.002
VTRUT217-A3	03-23442	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		100.	
RPL			1.	

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

Non-Responsive [redacted]
Analyst

Non-Responsive [redacted]

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTBEN216-B1 through VTRUT217-B6
P.O. No.:	Not Available
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3834
DCL Sample ID No.:	03-23432 through 03-23448
Sample Receipt Date:	8/8/2003
Preparation Date:	8/8/2003
Analysis Date:	8/12/2003

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
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
VTBEN216-B1	03-23432	190000.	19.
VTBEN216-B2	03-23433	4000.	0.40
VTBEN216-B3	03-23434	4400.	0.44
VTBEN216-B4	03-23435	36000.	3.6
VTBEN216-B5	03-23436	2400.	0.24
VTWES216-B1	03-23439	35.	0.0035
VTRUT217-B1	03-23443	1600.	0.16
VTRUT217-B2	03-23444	440.	0.044
VTRUT217-B3	03-23445	5800.	0.58
VTRUT217-B4	03-23446	97000.	9.7
VTRUT217-B5	03-23447	53000.	5.3
VTRUT217-B6	03-23448	8700.	0.87
	Prep Blank	ND	
% Recovery	LCS	93.	
% Recovery	23303MS	98.	
% Recovery	23303MSD	96.	
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

Analyst

Non-Responsive

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** WES
8/4/2003

Sample 1

Sample Number: VTWES216-A1
Pump: 648399

	Pre Flow Rate	Post Flow Rate
	2.498	2.466
	2.503	2.488
	2.501	2.49
	2.503	2.507
Average	**2.501**	**2.488**

Average Pre and Post **2.4945**

Time 1	13:34
Time 2	15:32
Total Time Sampled	**1:58**
Minutes Sampled	118.00

Volume **294.35 Liters**

Sample 2

Sample Number: N/A
Pump: N/A

	Pre Flow Rate	Post Flow Rate
	N/A	N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
Average	**N/A**	**N/A**

Average Pre and Post **N/A**

Time 1	N/A
Time 2	N/A
Total Time Sampled	**N/A**
Minutes Sampled	N/A

Volume **N/A** **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, Preventive 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.

Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Westminster Readiness Center

23 Armory Lane
Westminster, VT 05158

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 24, 2012

AEI Project #: 12685 3m VT Westminster RC

_____

Non-Responsive
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Westminster Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Westminster Readiness Center located at 23 Armory Lane, Westminster VT 05158. Non-Responsive performed the evaluation on October 24, 2012. The point of contact for the facility was Sergeant Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the roof drain located in the drill hall. Due to the height of the peeling paint, a sample was not collected. A Evidence of peeling paint that had been repaired was observed in the women's latrine. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot ($\mu g/ft^2$)) in all areas sampled.

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition A damaged fitting was observed on a roof drain at the roof line of the drill hall. Due to the height of the peeling paint, a sample was not collected.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the Drill Hall and Kitchen. The illumination measurements indoors ranged from 10.7 foot candles (fc) to 124.4 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 68.1° F and 29.0% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new custodial products are required per OSHA 29 CFR 1910.1200.

Overall, the Westminster Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Westminster Readiness Center located at 23 Armory Lane, Westminster VT 05158. Non-Responsive performed the evaluation on October 24, 2012. The point of contact for the facility was Sergeant Non-Responsive The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Westminster Readiness Center was built in 1976. The readiness center is staffed by 7 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Westminster Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Westminster facility consist exclusively of supply and administrative duties. No other maintenance of vehicles or other physical tasks are performed at the facility. A small garage exists in the facility basement but it is only used for storage.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the roof drain located in the drill hall. Due to the height of the peeling paint, a sample was not collected. Evidence of peeling paint that had been repaired was observed in the women's latrine.

To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum levels for adult exposures. Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 –Dust Wipe Sampling Data Sheet for VT ARNG Westminster Readiness Center on October 24, 2012.

Wipe Sample #	Wipe Sample Location	Lead by Weight (µg/ft^2)
WRC-01	Kitchen, Prep Table	<110
WRC-02	Drill Hall, Middle of floor	<110
WRC-03	Drill Hall, on stored desks	<110
WRC-04	Drill Hall, Wall climbing mats	<110
WRC-05	Room 12, Supply grill	<110
WRC-06	Room 19, Top of refrigerator	<110
WRC-07	Room 14, Work station	<110
WRC-08	Room 8, Window sill	<110
WRC-09	Classroom, From table	<110
WRC-10	Stairs outside former firing range, Floor	<110
WRC-11	Garage/Former Indoor Firing Range, Former bullet trap	<110

Table 1 –Dust Wipe Sampling Data Sheet for VT ARNG Westminster Readiness Center on October 24, 2012.

Wipe Sample #	Wipe Sample Location	Lead by Weight (µg/ft²)
WRC-12	Garage/Former Indoor Firing Range, Light fixture	<110
WRC-13	Garage/Former Indoor Firing Range, Overhead heater	<110
WRC-14	Garage/Former Indoor Firing Range, Stored lockers	<110
WRC-15	Garage/Former Indoor Firing Range, Floor	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). A damaged fitting was observed on a roof drain at the roof line of the drill hall. Due to the height of the peeling paint, a sample was not collected.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping was good. Most areas were clean and tidy.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the Drill Hall and Kitchen. The illumination measurements indoors ranged from 10.7 foot candles (fc) to 124.4 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7575, factory calibrated in July, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 62.7 to 74.4° F and 31.4 to 44.1% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 68.1° F and 29.0% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 406 to 664 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.5 to 0.8 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was not readily available, and updated MSDSs are required per OSHA 29 CFR 1910.1200. It is recommended that a copy of the written hazard communication program be placed in every MSDS notebook. MSDSs for some new custodial products are required per OSHA 29 CFR 1910.1200.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the Westminster Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

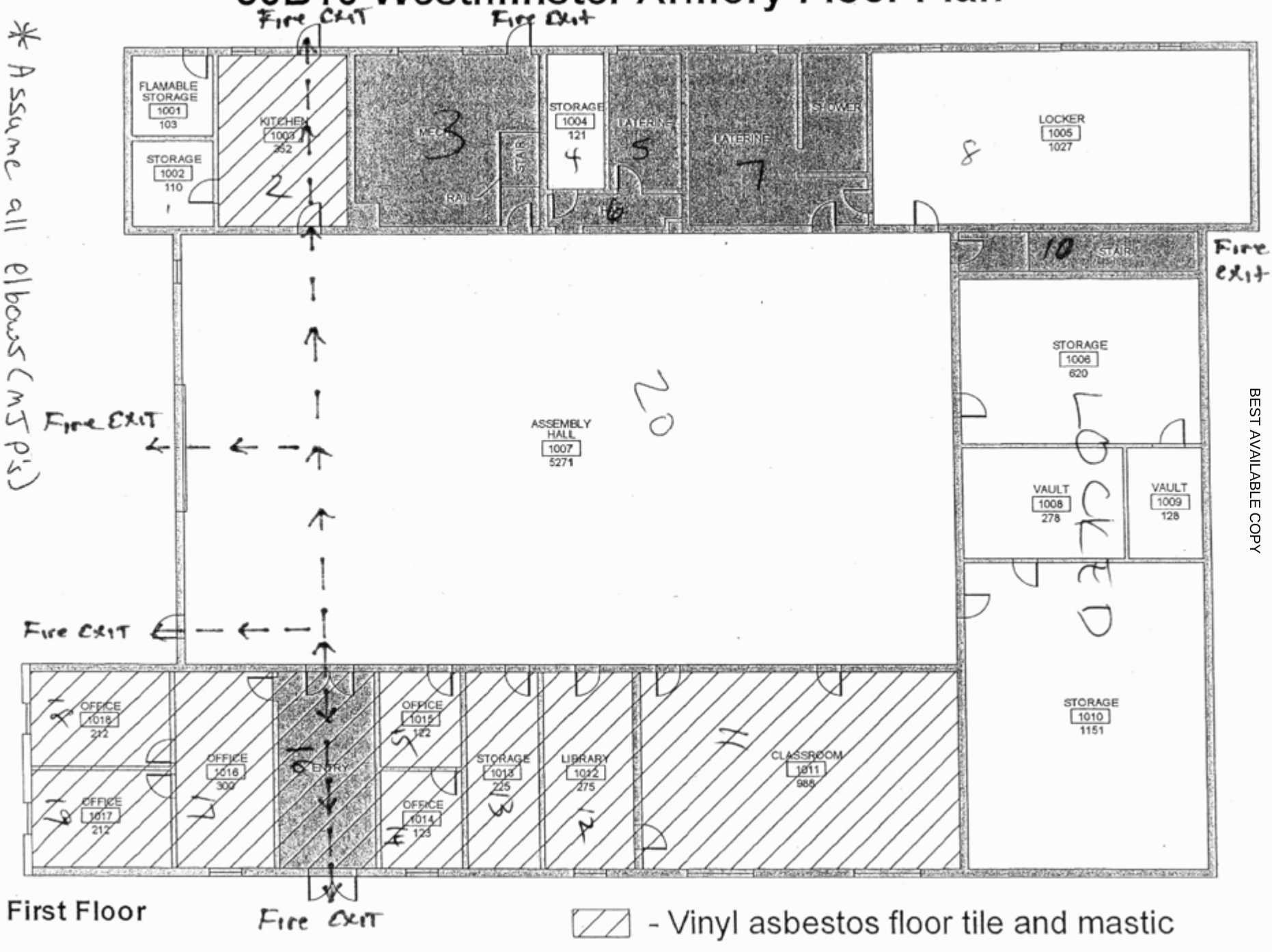
9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2012.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.
8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.

10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout

50B10 Westminster Armory Floor Plan



Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	Westminster, RC	**Chain Of Custody:**	514369
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Westminster, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/9/2012 **Report Date:** 11/9/2012

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
13010676	WRC-01	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010677	WRC-02	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010678	WRC-03	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010679	WRC-04	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010680	WRC-05	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010681	WRC-06	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010682	WRC-07	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010683	WRC-08	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010684	WRC-09	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010685	WRC-10	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010686	WRC-11	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010687	WRC-12	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010688	WRC-13	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010689	WRC-14	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	
13010690	WRC-15	Flame	Wipe	****	0.108	110	ug/ft^2	<12	<110	ug/ft^2	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

AIHA LAP, LLC ACCREDITED LABORATORY
INDUSTRIAL HYGIENE, ENVIRONMENTAL LEAD & ENVIRONMENTAL MICROBIOLOGY
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www.aihaaccreditedlabs.org
LAB #100470

Client:	National Guard Bureau	**Job Name:**	Westminster, RC	**Chain Of Custody:**	514369
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Westminster, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/9/2012 **Report Date:** 11/9/2012

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.

Analyst: 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) 514369

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: WESTMINSTER RC
2. Job Location: WESTMINSTER VT
3. Job #: PO #: W912K6-09-A-0003
4. Contact Person: [redacted] Non-Responsive
5. Submitted by: [redacted] Non-Responsive

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

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

NORMAL BUSINESS HOURS
- ☐ Immediate ☐ 3 Day ☐ Results Required By Noon
- ☐ Next Day ☒ 5 Day +
- ☐ 2 Day Date Due: 11/9/12

REPORT TO:
- ☒ Inclu [redacted] Non-Responsive with Report
- ☒ Emai [redacted] @ariaenviro.com
- ☐ 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 (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ☐ Pb Paint Chip (QTY)
- ☒ *Pb Dust Wipe (wipe type Ghost Wipe) 15 (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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	SEE ATTACHED FIELD DATA SHEETS														

CLIENT CONTACT
(LABORATORY STAFF ONLY)

Date/Time: Contact: By:

Date/Time: Contact: By:

Date/Time: Contact: By:

[redacted] Non-Responsive

[redacted] Non-Responsive

LABORATORY STAFF ONLY: (CUSTODY)

1. Date/Time RCVD: 11/2/12 @ Via: FedEx By (Print): [redacted] Non-Responsive Sig
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 957

Aria Environmental, Inc.

Date Collected: October 24, 2012
Location: Westminster Readiness Center
Project No: J120685
Inspector: Non-Responsive

Table 1 –Dust Wipe Sampling Data Sheet for VT ARNG Westminster Readiness Center on October 24, 2012.

Wipe Sample #	Sample Location	Area
WRC-01	Kitchen, Prep Table	10 cm x 10 cm
WRC-02	Drill Hall, Middle of floor	10 cm x 10 cm
WRC-03	Drill Hall, on stored desks	10 cm x 10 cm
WRC-04	Drill Hall, Wall climbing mats	10 cm x 10 cm
WRC-05	Room 12, Supply grill	10 cm x 10 cm
WRC-06	Room 19, Top of refrigerator	10 cm x 10 cm
WRC-07	Room 14, Work station	10 cm x 10 cm
WRC-08	Room 8, Window sill	10 cm x 10 cm
WRC-09	Classroom, From table	10 cm x 10 cm
WRC-10	Stairs outside former firing range, Floor	10 cm x 10 cm
WRC-11	Garage/Former Indoor Firing Range, Former bullet trap	10 cm x 10 cm
WRC-12	Garage/Former Indoor Firing Range, Light fixture	10 cm x 10 cm
WRC-13	Garage/Former Indoor Firing Range, Overhead heater	10 cm x 10 cm
WRC-14	Garage/Former Indoor Firing Range, Stored lockers	10 cm x 10 cm
WRC-15	Garage/Former Indoor Firing Range, Floor	10 cm x 10 cm

Appendix C
Photo Documentation

Westminster RC

Photo 1: Westminster Readiness Center

Photo 2: Westminster Readiness Center

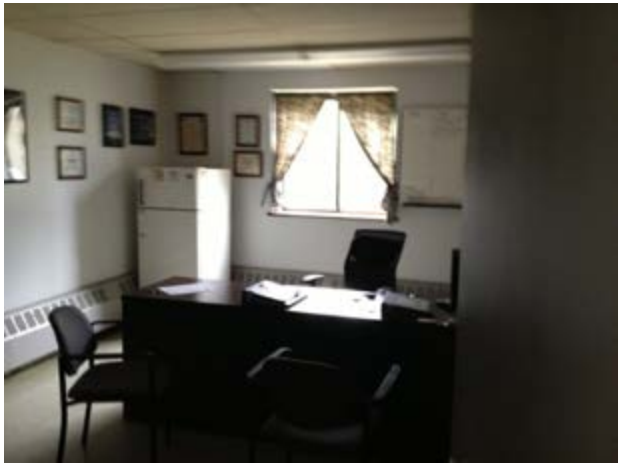

Photo 3: Office

Photo 4: Office

Westminster RC

Photo 5: Former Firing Range

Photo 6: Former Firing Range

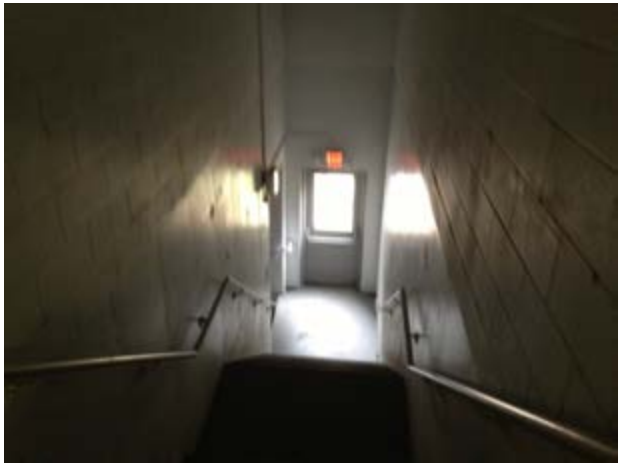

Photo 7: Stairwell with Exit

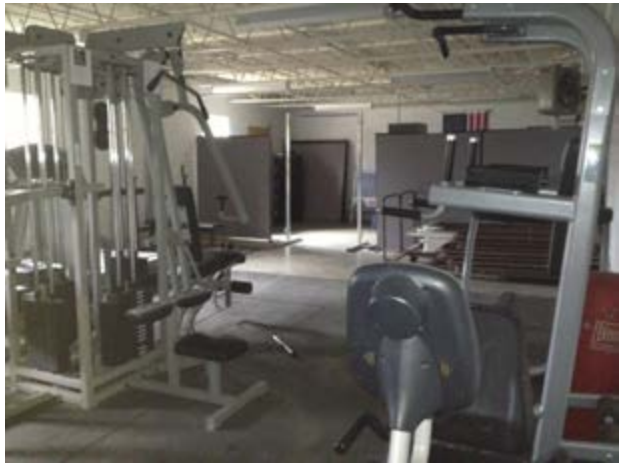

Photo 8: Fitness Room

Westminster RC

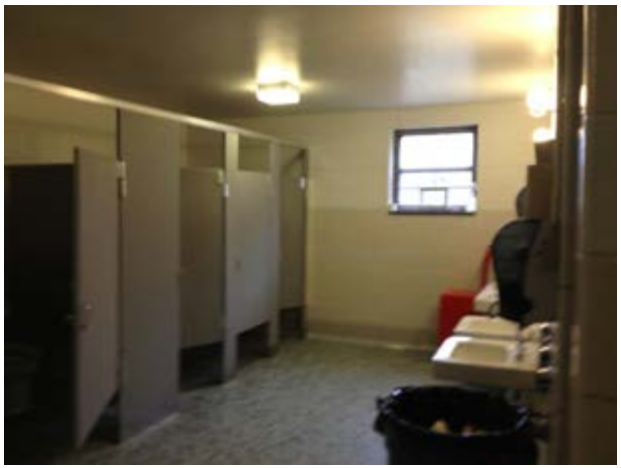

Photo 9: Restroom

Photo 10: Drill Hall

Photo 11: Classroom

Photo 12: Rear of Classroom

Westminster RC

Photo 13: Office

Photo 14: Janitor's Closet

Photo 15: Mechanical Room

Photo 16: Mechanical Room

Westminster RC

Photo 17: Kitchen

Photo 18: Rear of Readiness Center

Photo 19: Drill Hall

Photo 20: Damaged Roof Drain Fitting at Roof Deck of Drill Hall

Westminster RC

Photo 21: Peeling Paint on Roof Drain in Drill Hall

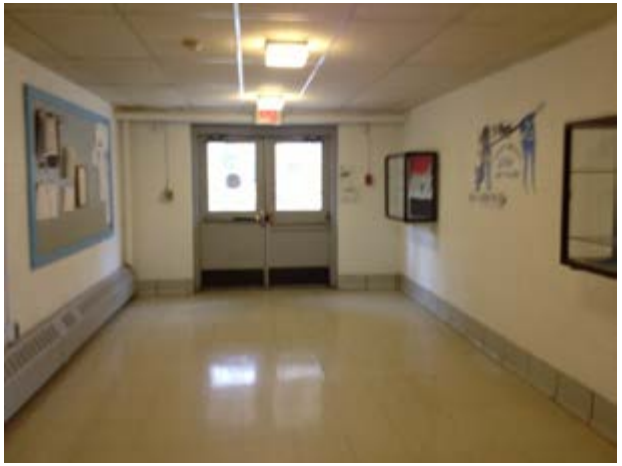

Photo 22: Entryway

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Westminster	IAQ								Light		
Date	10/24/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400L
Facility Description	Westminster RC			Serial Number		7575x1228011						Serial Number		4980243
Weather Conditions				Last Calibration		Jul-12						Last Calibration		16-Apr-12
Location	Function	No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
1	Storage			69.8		34.0		458		0.7		22.3		30
2	Kitchen			69.8		34.1		406		0.7		40.6	X	50
3	Mechanical Room			74.2		31.6		590		0.5		62.4		30
4	Janitor's Closet			74.7		36.7		664		0.5		40.3		30
5	Women's Latrine			73.3		31.4		540		0.5		10.7		5
6	Hallway			73.0		33.2		544		0.8		45.5		5
7	Men's Latrine			72.3		37.6		553		0.7		57.8		5
8	Weight Room			71.1		37.7		555		0.5		36.7		30
9	Attached Garage/Storage			64.4	X	39.2	X	441		0.8		35.4		30
10	Stairwell			62.7	X	40.9	X	465		0.7		29.8		5
11	Classroom			67.0	X	44.1	X	529		0.5		106.4		30-50
12	Commander's Office			68.1	X	40.5	X	474		0.5		72.5		30-50
13	1st SGT Office			69.8		40.1		516		0.5		33.7		30-50
14	Office			70.1		39.5		516		0.5		124.4		30-50
15	Recruiter's Office			70.7		39.7		590		0.6		105.2		30-50
16	Entry Vestibule			70.5		37.7		480		0.7		30.2		10
17	Ofiice			70.5		37.7		480		0.7		83.0		30-50
18	Office			71.2		39.6		507		0.5		58.5		30-50
19	Office			71.5		38.1		556		0.6		51.5		30-50
20	Drill Hall			71.5		36.3		527		0.5		35.9	X	50

BEST AVAILABLE COPY

NATIONAL GUARD BUREAU
ARMY NATIONAL GUARD
REGION NORTH INDUSTRIAL HYGIENE OFFICE
ATTN: NGB-AVS-SI
301-IH OLD BAY LANE
HAVRE DE GRACE, MD 21078-4094

NGB-AVS-SI (40-5f) 21 January 2004

MEMORANDUM FOR VTARNG, Winooski, RC, ATTN: SSG Non-Responsive
255 Lafountan Street, Winooski, VT 05404

SUBJECT: Annual Survey Report

1. I have enclosed the industrial hygiene survey report completed by Shaw Environmental, Inc.

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

Non-Responsive
Regional Industrial Hygienist

Encl

CF: SOHM, LTC Non-Responsive

BEST AVAILABLE COPY

Shaw Environmental, Inc.

312 Directors Drive
Knoxville, TN 37923
865.690.3211
Fax 865.690.3626

Shaw® Shaw Environmental, Inc.

National Guard Armory
Winooski Readiness Center – Winooski, Vermont

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

04 January 2004

National Guard Armory
Winooski Readiness Center – Winooski, Vermont

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

04 January 2004

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 Winooski Readiness Center in Winooski, Vermont. Non-Responsive performed the evaluation on 21 July 2003 and 9 October 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 Exposure
- Lighting
- Converted Indoor Firing Range
- 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
- Water Damage
- Presence of Mold
- Housekeeping
- Ergonomic Concerns
- Safety and Industrial Hygiene Programs

- Ventilation System Evaluation
- Contamination of Clean Air Sources
- Noise Exposure
- HVAC Systems

Areas where there were industrial hygiene concerns are as follows:

- Wipe sampling for lead revealed concentrations above the recommended level at four locations in the assembly/drill hall. It is recommended that these surfaces and the areas immediately around these surfaces 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.
- Wipe sampling for lead revealed concentrations above a level of 40 micrograms per square foot ($\mu g/ft^2$) in the Company B Administrative Office. 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.
- Peeling paint was observed in the supply room (former bullet trap room of firing range) and bulk sampling results revealed this paint to be a lead-based paint. Anyone who may perform repair and/or maintenance activities on this surface should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be taken.
- 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.
- Indoor air quality measurements revealed that the humidity at the armory exceeded the recommended levels. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed at the armory.
- Lighting measurements were conducted at the armory. The lighting did not meet minimum requirements in most areas; therefore consideration should be given to providing more lighting in these areas. 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.
- Wipe sampling for lead in the converted firing range revealed concentrations above the recommended level at all of the locations sampled. These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead

concentrations are reduced to below recommended levels. In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

1.0 Introduction

Shaw Environmental, Inc. (Shaw) was contracted to perform an industrial hygiene evaluation for the Winooski Readiness Center in Winooski, Vermont. Non-Responsive performed the evaluation on 21 July 2003 and 9 October 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 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 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/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 hall. If there were any positive results from the drill floor, 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 recommended level of 200 micrograms lead per square foot ($\mu g/ft^2$) (See Appendix E) except at four locations. The samples obtained from the heater unit flap surface, locker (AYDINYAN) top surface, locker (BOYLE) top surface, and soda machine top surface in the assembly room had lead concentrations of 3,300, 43,000, 2,100, and 1,900 $\mu g/ft^2$, respectfully. It is recommended that these surfaces and the immediate areas around the surfaces be thoroughly cleaned to reduce the lead level to below 200 $\mu g/ft^2$. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, any other dusty/dirty areas in the assembly area/drill floor should be thoroughly cleaned.

In addition, wipe sampling for lead revealed concentrations above a level of 40 $\mu g/ft^2$ in the Company B Administrative Office on the stereo system top surface. Please note that the *Recommendations for Surface Lead Dust in Armories* (Appendix B) 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 one (1) full-time building occupant. (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 actions are necessary.

2.2 Physical Condition of Facility

2.2.1 Peeling Paint - Lead

Peeling paint was observed in the armory. The Department of Housing and Urban Development (HUD) defines lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 0.5 percent by weight. Bulk sampling results revealed lead at a concentration of 1.1 percent by weight in the paint sample taken from the supply room (former bullet trap room of firing range). The results of the sampling are provided in Table 3.

Anyone who may perform repair and/or maintenance activities on surfaces coated with lead-based paint should be made aware of the presence of the lead-based paint so appropriate precautions (control of exposures, personal protective equipment, training, etc.) can be taken.

It should be noted that the firing range lead wipe sampling results (See Section 2.8) indicate lead concentrations above the recommended level of 200 $\mu g/ft^2$, therefore the possibility exists that the lead concentration indicated by the paint sample taken from the firing range room could be due to deposition rather than lead based paint.

2.2.2 Visual Inspection - Asbestos

A visual inspection was made to determine if there was any suspected asbestos-containing material at the armory. Floor tiles suspected of containing asbestos were observed. The suspected asbestos-containing materials were floor tiles in the Company B RNCO Office (Room 8), Company B ADMIN Office (Room 9), and Company C ADMIN Office (Room 2) (approximately 895 square feet), and insulation in the boiler room (approximately 15-16 linear feet and 14-16 pipe joints/elbows). The condition of the floor tiles materials was considered average since there was some damage to tiles at the doorways. The condition of the boiler room insulation materials was considered good (no rips, tears, or other damage).

An operation 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 on the Company B ADMIN Office (Room 9) ceiling.

The source of the water damage was likely from a roof leak. John MacFarland stated that the roof membrane was replaced in the past year and a half. The source of the water damage is not longer present; therefore, no additional actions are necessary. .

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

2.3.2 Indoor Air Quality

Interviews with employees revealed no indoor air quality concerns at the armory. However, measurements for humidity revealed that levels exceeded the American

Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) recommended level of 60% in the armory. Since there is no HVAC system at the armory, it is recommended that a dehumidification system be installed 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 HAZCOM program was the only program listed above that was applicable at the facility. The HAZCOM program was evaluated and it was determined that the program 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 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 Company C ADMIN office, Company C CDR/1AG Office, Kitchen, Company B ADMIN Office, and the Company B RNCO Office. Some areas in the classroom meet minimum lighting requirements. 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 collected 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:

- Light fixture, at 240,000 micrograms lead per square foot ($\mu g/ft^2$); and
- stored item (outside caged storage area), at 180 $\mu g/ft^2$;
- floor, at 980 $\mu g/ft^2$; and
- stored item (youth group storage area), at 4,500 $\mu g/ft^2$.

The lead levels at three of these locations were above 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). These areas must be decontaminated by a thorough cleaning along with re-sampling until surface lead concentrations are reduced to below recommended levels. For guidance on the proper method of cleaning, please refer to NG PAM 385-16 (*Guidelines for Converting Indoor Firing Ranges to Other Uses*). In addition, employees should not be allowed to work in these areas without protective clothing until the areas have been cleaned and re-sampled.

2.9. HVAC System

There was not a HVAC system at the armory.

2.10. HHHM

A Health Hazard Information Module (HHHM) 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, water damage, visible mold, housekeeping, ergonomic conditions, safety and industrial hygiene programs, ventilation systems or contamination of clean air sources, noise exposure, and HVAC systems.

There were industrial hygiene concerns at the armory with regards to lead surface contamination, peeling lead-based paint, suspected asbestos-containing material, indoor air quality, surface lead contamination in the converted firing range, 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
Winooski, Vermont
Dates of Sampling: 21 July 2003 and 9 October 2003

Sample Number	Location	Results, µg/ft²[a]
VTWIN202-1	Drill Floor – On Floor (See Building Layout - Appendix B)	< 110
VTWIN202-2	Drill Floor - On Floor (See Building Layout – Appendix B)	< 110
VTWIN202-3	Drill Floor – On Floor (See Building Layout - Appendix B)	< 110
VTWIN202-4	Drill Floor - On Floor (See Building Layout – Appendix B)	< 110
VTWIN202-5	Drill Floor - On Floor (See Building Layout - Appendix B)	< 110
VTWIN202-6	Field Blank	< 12 µg
VTWIN202-11	Kitchen counter top	< 2.7
VTWIN202-12	Field Blank	< 0.3 µg
VTWIN202-13	Classroom - table top	4.1
VTWIN202-14	Company B RNCO Office - desktop	6.6
VTWIN202-15	Company B Administrative Office – stereo system top surface	110
VTWIN202-16	Company C CDR/1SG Office - shelf top	14
VTWIN283-1	Assembly Room - heater unit flap surface (See Building Layout – Appendix B)	3300
VTWIN283-2	Assembly Room - locker (AYDINYAN) top surface (See Building Layout - Appendix B)	43000
VTWIN283-3	Assembly Room – locker (BOYLE) top surface (See Building Layout – Appendix B)	2100
VTWIN283-4	Assembly Room – soda machine top surface (See Building Layout - Appendix B)	1900
VTWIN283-5	Assembly Room - fire alarm control box top surface (See Building Layout - Appendix B)	36
VTWIN283-6	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.

In armories that do not contain childcare facilities, the NGB Region North Industrial Hygiene Office recommends cleaning the areas with lead concentrations greater than 200 µg/ft².

Table 2
Breathing Zone Air Samples for Lead
National Guard Armory
Winooski, Vermont
Date of Sampling: 21 July 2003

Sample Number	Employee	Sampling Information			Results (mg/m^3) [a]
		Time Sampled / Minutes	Flow Rate (lpm) [b]	Volume (liters)	
VTWIN202-A1	Non-Responsive	0958-1059/61	2.507	152.91	<0.007
VTWIN202-A2	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.

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Table 3
Peeling Paint Sampling for Lead
National Guard Armory
Winooski, Vermont
Date of Sampling: 21 July 2003

Sample Number	Location	Results, % By Weight
VTWIN202-B1	Storage room (former bullet trap room of firing range) wall	1.1

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
Winooski, Vermont
Date of Sampling: 21 July 2003

Location	Occupants in Area	Carbon Dioxide, parts per million parts of air (ppm)	Percent (%) Humidity	Temperature (°F)
1st Floor Classroom	1	405	61.9	78.4
Outdoors	0	379	68.6	74.3

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

Winooski, Vermont

Date of Sampling: 21 July 2003

Location	Luminance (fc)[a]	Standard (fc)[a]	Standard Met
Company C ADMIN Office	19.3-58.3	70	No
Company C CDR/1SG Office	40.1-79.3	70	Some Areas
Kitchen	20.1-65.5	70	No
Company B ADMIN Office	23.5-58.3	70	No
Company B RNCO Office	20.1-59.6	70	No
Classroom	39.1-96.5	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.

Table 6

Wipe Sampling for Lead – Converted Firing Range

National Guard Armory

Winooski, Vermont

Date of Sampling: 21 July 2003

Sample Number	Location	Results, $\mu g/ft^2$ [a]
VTWIN202-6	Blank	< 12 µg
VTWIN202-7	Light Fixture	240,000
VTWIN202-8	Stored Item (caged area)	180
VTWIN202-9	Floor	980
VTWIN202-10	Stored Item (youth group storage area)	4500

[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.

Appendix A
HHIM Data Form(s)

HEALTH HAZARD INFORMATION MODULE: INDUSTRIAL HYGIENE SURVEY

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

SECTION 1. DEMOGRAPHIC DATA

RLOC	INSTALLATION	BLDG/RM NO.
	Winooski Armory Vermont ARNG	Winooski

OCATION/CODE	OPERATION/CODE
Administrative Areas/AA	Administrative OP/ADO

URVEY DATE	EVALUATOR (Initials)
21 July 2003	Non-Responsive

MACOM/CODE	SUBMACOM/CODE	SUPERVISOR
Army National Guard	XX	Non-Responsive SSG

ELEPHONE/DSN NO.	UNIT/ORGANIZATION	RAC	FREQUENCY (hrs/day)
802-655-1288		5	8

IO. CIV(S)	NO. MIL	NO. CONTRACTOR(S)	NO. LOC(S)	NO. OTHER
0	6	0	0	0

SECTION 2. FACILITY DATA

AB 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			EAR PLUGS			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-low	D Uncontrolled Physical
7439-92-1	Lead, Inorganic dusts and fumes, as Pb	2-moderate	C Uncontrolled Respiratory
1332-21-4	Asbestos (other)	2-moderate	C Uncontrolled Respiratory

SECTION 5. PERSONNEL DATA

LAST NAME	FIRST NAME	MI	SEX	SSN	CATEGORY
Non-Responsive			M	Non-Responsive	MIL
		A.	F		
			M		
			M		
			M		
			M		

SECTION 6. COMMENTS

No comments See attached sheet

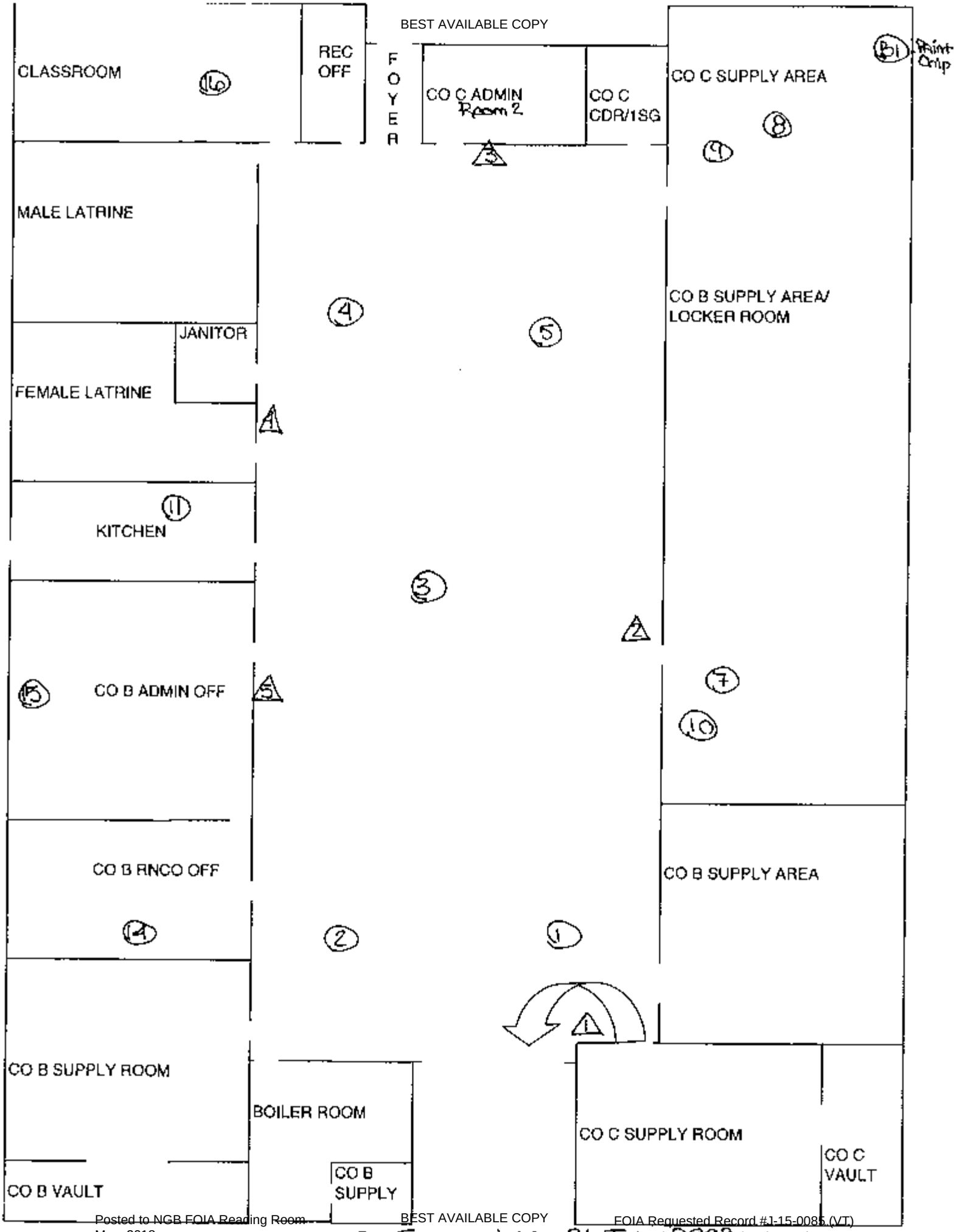
Survey conducted by Michele Seman, Building contains 6 military full-time employees. Employees perform mainly administrative functions.

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.

Appendix B
Building Layout



0 Sample dose 21 July 2008

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:**	VTWIN202	**Chain Of Custody:**	115804
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	8/5/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	05-Aug-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
0359434	VTWIN202-1	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359435	VTWIN202-2	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359436	VTWIN202-3	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359437	VTWIN202-4	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359438	VTWIN202-5	Flame	Wipe	****	0.111	108.00	ug/ft²	< 110	ug/ft²	
0359439	VTWIN202-6	Flame	Wipe Blank	****	N/A	12.00	ug	< 12	ug	
0359440	VTWIN202-7	Flame	Wipe	****	0.111	108.00	ug/ft²	240000	ug/ft²	
0359441	VTWIN202-8	Flame	Wipe	****	0.111	108.00	ug/ft²	180	ug/ft²	
0359442	VTWIN202-9	Flame	Wipe	****	0.111	108.00	ug/ft²	980	ug/ft²	
0359443	VTWIN202-10	Flame	Wipe	****	0.111	108.00	ug/ft²	4500	ug/ft²	

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

AMA Analytical Services, Inc.
A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWIN283	**Chain Of Custody:**	118715
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/21/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	0701	**Report Date:**	21-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
0402898	VTWIN283 -1	Furnace	Wipe	****	0.111	675.07	ug/ft²	3300	ug/ft²	
0402899	VTWIN283 -2	Furnace	Wipe	****	0.111	13501.35	ug/ft²	43000	ug/ft²	
0402900	VTWIN283 -3	Furnace	Wipe	****	0.111	675.07	ug/ft²	2100	ug/ft²	
0402901	VTWIN283 -4	Furnace	Wipe	****	0.111	675.07	ug/ft²	1900	ug/ft²	
0402902	VTWIN283 -5	Furnace	Wipe	****	0.111	5.40	ug/ft²	36	ug/ft²	
0402903	VTWIN283 -6	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]

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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

NVLAP
NY ELAP
AIHA

Client:	National Guard Bureau	**Job Name:**	VTWIN202	**Chain Of Custody:**	118932
Address:	301-IH Old Bay Lane, Attn: NGB-AVN-SI, State Military Reservation	**Job Location:**	Not Provided	**Date Analyzed:**	10/30/2003
	Havre de Grace, Maryland 21078	**Job Number:**	Not Provided	**Person Submitting:**	[redacted]
		P.O. Number:	Not Provided	**Report Date:**	30-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
0404841	VTWIN202-11	Furnace	Wipe	****	0.111	2.70	ug/ft²	<	2.7	ug/ft²	
0404842	VTWIN202-12	Furnace	Wipe Blank	****	N/A	0.30	ug	<	0.3	ug	
0404843	VTWIN202-13	Furnace	Wipe	****	0.111	2.70	ug/ft²		4.1	ug/ft²	
0404844	VTWIN202-14	Furnace	Wipe	****	0.111	2.70	ug/ft²		6.6	ug/ft²	
0404845	VTWIN202-15	Furnace	Wipe	****	0.111	67.51	ug/ft²		110	ug/ft²	
0404846	VTWIN202-16	Furnace	Wipe	****	0.111	2.70	ug/ft²		14	ug/ft²	

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

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-A1 through VTAAS204-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22309 through 03-22345
Sample Receipt Date:	7/28/2003
Preparation Date:	07/29/03
Analysis Date:	07/31/03

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

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
800 260-6071, FAX 415 893-9469

Results
Lead

Client #	DCL #	Sample Volume (L)	µg/sample	mg/m³
VTCAM205-A1	03-22309	407.54	ND	<0.002
VTCAM205-A2	03-22310	377.66	ND	<0.003
VTCAM205-A3	03-22311	0	ND	-
VTWIN202-A1	03-22313	152.91	ND	<0.007
VTWIN202-A2	03-22314	0	ND	-
VTENO196-A1	03-22316	150.55	ND	<0.007
VTENO196-A2	03-22317	0	ND	-
VTWIL197-A1	03-22319	199.78	ND	<0.005
	Prep Blank 1		ND	
% Recovery	LCS 1		96.	
% Recovery	LCS 2		96.	
RPL			1.	

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

Non-Responsive

Analyst

Non-Responsive

DATA CHEM LABORATORIES, INC.

Submitted To: Non-Responsive
Shaw Environmental, Inc.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTRED210-A2 through VTWIN210-A3
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Filter
Method Reference:	NIOSH 7300
DCL Set ID No.:	03-S-3799
DCL Sample ID No.:	03-23284 through 03-23312
Sample Receipt Date:	8/4/2003
Preparation Date:	08/07/03
Analysis Date:	08/07/03

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
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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
VTRED210-A2	03-23284	0	ND	-
VTNEW209-A1	03-23285	210.24	ND	<0.005
VTNEW209-A2	03-23286	0	ND	-
VTBRA209-A1	03-23288	197.36	ND	<0.005
VTBRA209-A2	03-23289	0	ND	-
VTLYN209-A1	03-23290	186.67	ND	<0.005
VTLYN209-A2	03-23291	187.06	ND	<0.005
VTLYN209-A3	03-23292	0	ND	-
VTNOR213-A1	03-23293	376.81	ND	<0.003
VTNOR213-A2	03-23294	0	ND	-
VTLUD212-A1	03-23297	157.79	ND	<0.006
VTLUD212-A2	03-23298	275.40	ND	<0.004
VTLUD212-A3	03-23299	0	ND	-
VTWIN212-A1	03-23305	173.64	ND	<0.006
VTWIN212-A2	03-23306	0	ND	-
VTVER210-A1	03-23307	259.68	ND	<0.004
VTVER210-A2	03-23308	0	ND	-
VTRED210-A1	03-23309	158.68	ND	<0.006
VTWIN210-A1	03-23310	218.92	ND	<0.005
VTWIN210-A2	03-23311	193.56	ND	<0.005
VTWIN210-A3	03-23312	0	ND	-
	Prep Blank		ND	
% Recovery	LCS		99.	
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.
101 Fieldcrest Ave., 4th Floor
Edison, NJ 08837

Reference Data:	**Lead**
Client Sample No.:	VTCAM205-B1 through VTMCR203-B2
P.O. No.:	07-02
Sample Location:	VT
Sample Type:	Paint Chip
Method Reference:	3050B/6010B
DCL Set ID No.:	03-S-3621
DCL Sample ID No.:	03-22312 through 03-22339
Sample Receipt Date:	07/28/2003
Preparation Date:	07/29/2003
Analysis Date:	07/31/2003

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
800 280-8071, FAX 415 893-9469

Results
Lead

Client #	DCL #	mg/Kg (ppm)	% by weight
VTCAM205-B1	03-22312	160.	0.016
VTWIN202-B1	03-22315	11000.	1.1
VTENO196-B1	03-22318	96000.	9.6
VTSTA197-B1	03-22327	1800.	0.18
VTWAT203-B1	03-22330	40.	0.0040
VTWAT203-B2	03-22331	57.	0.0057
VTMOR203-B1	03-22338	3900.	0.39
VTMOR203-B2	03-22339	11000.	1.1
	Prep Blank	ND	
% Recovery	LCS	87.	
% Recovery	03-22327 MS	* 0.	
% Recovery	03-22327 MSD	* 4.	
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.
* Low recovery due to non-homogeneous sample matrix.

Non-Responsive

Analyst

Non-Responsive

Reviewer

Industrial Hygiene Sampling Calculation Worksheet

National Guard Armory **Location:** WINOOSKI
Date: JULY 21, 2003

Sample 1

Sample Number: VTWIN202-A1
Pump: 648339

	Pre Flow Rate	Post Flow Rate
	2.542	2.475
	2.542	2.483
	2.534	2.477
	2.524	2.477
Average	**2.536**	**2.478**

Average Pre and Post **2.5068**

Time 1	9:58
Time 2	10:59
Total Time Sampled	**1:01**
Minutes Sampled	61.00

Volume **152.91 Liters**

Sample 2

Sample Number: N/A
Pump: N/A

	Pre Flow Rate	Post Flow Rate
	N/A	N/A
	N/A	N/A
	N/A	N/A
	N/A	N/A
Average	N/A	N/A

Average Pre and Post N/A

Time 1	N/A
Time 2	N/A
Total Time Sampled	N/A
Minutes Sampled	N/A

Volume N/A **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, Preventive 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.

Field Notes and Checklist

State: Vermont Location: Winooski Date: 7/21/03

Contact: SS Non-Responsive

1.0 Sampling for Lead

1.1 Wipe Sampling

VTWIN202-

Sample #: 1 Picture #: ____ Location: drill hall floor (see diagram)
Sample #: 2 Picture #: ____ Location: "
Sample #: 3 Picture #: ____ Location: "
Sample #: 4 Picture #: ____ Location: "
Sample #: 5 Picture #: ____ Location: "
Sample #: 6/12 Picture #: ____ Location: blanks
Sample #: 7 Picture #: ____ Location: firing range
Sample #: 8 Picture #: ____ Location: "
Sample #: 9 Picture #: ____ Location: "
Sample #: 10 Picture #: ____ Location: "
Sample #: 11 Picture #: ____ Location: Kitchen - countertop
Sample #: 13 Picture #: ____ Location: Classroom - table surface
Sample #: 14 Picture #: ____ Location: Co B Rm 203 office - top of desk
Sample #: 15 Picture #: ____ Location: Co B ADMIN office - top of stereo
Sample #: 16 Picture #: ____ Location: Co C CDR/1SG office - top of shelf
Sample #: ____ Picture #: ____ Location: ____
Sample #: ____ Picture #: ____ Location: ____
Sample #: ____ Picture #: ____ Location: ____
Sample #: ____ Picture #: ____ Location: ____
Sample #: ____ Picture #: ____ Location: ____

(Also, please see the sketch of sampling locations.)

1.2 Breathing Zone Air Sampling

Sample #: A1 Employee Sampled: Non-Responsive
Sample #: — Employee Sampled: ____

2.0 Physical Condition of Facility

2.1 Peeling Paint - Lead

Peeling paint observed (Yes or No): Yes

If peeling paint observed, samples were taken as follows:

Sample #: B1 Picture #: ____ Location: CoC Supply Area
Condition (Good, Average, Poor): Poor Quantity: 51 ft²
Sample #: ____ Picture #: ____ Location: _____
Condition (Good, Average, Poor): _____ Quantity: _____ ft²
Sample #: ____ Picture #: ____ Location: _____
Condition (Good, Average, Poor): _____ Quantity: _____ ft²
Sample #: ____ Picture #: ____ Location: _____
Condition (Good, Average, Poor): _____ Quantity: _____ ft²
Sample #: ____ Picture #: ____ Location: _____
Condition (Good, Average, Poor): _____ Quantity: _____ ft²

2.2 Visual Inspection - Asbestos

Suspected asbestos-containing material observed (Yes or No): Yes Possible

If suspected asbestos-containing material observed, samples were taken as follows:

Location 1: Room #8 (CoB Bldg OFF) floor tile Picture #: _____
Condition: good/average at door Approximate (Square or Linear Feet): 19.5 x 10 = 195 ft²
Location 2: Room #9 (CoB Bldg OFF) floor tile Picture #: _____
Condition: good/average at door Approximate (Square or Linear Feet): 19.5 x 20.5 = 400 ft²
Location 3: Room #2 (CoB Bldg OFF) floor tile Picture #: _____
Condition: good/average at door Approximate (Square or Linear Feet): 15 x 20 = 300 ft²
Location 4: Boiler room pipes and joints Picture #: _____
Condition: _____ Approximate (Square or Linear Feet): 15-16 linear feet and 14-16 joints/elbows
Location 5: _____ Picture #: _____
Condition: _____ Approximate (Square or Linear Feet): _____

2.3 Visual Inspection – Water Damage and Mold

Water damage observed (Yes or No): Yes – as per John MacFarland No new damage, roof membrane replaced within 1 1/2 years, evidence of water damaged repairs

If yes, water damage was observed at the following locations:

Location 1: ______________________ Picture #: ________
Location 2: ______________________ Picture #: ________
Location 3: ______________________ Picture #: ________
Location 4: ______________________ Picture #: ________
Location 5: ______________________ Picture #: ________

Mold observed (Yes or No): NO – BATHROOM (Male) [illegible] musty; backs up frequently

If yes, mold was observed at the following locations:

Location 1: ______________________ Picture #: ________
Location 2: ______________________ Picture #: ________
Location 3: ______________________ Picture #: ________
Location 4: ______________________ Picture #: ________
Location 5: ______________________ Picture #: ________

2.4 Visual Inspection - Housekeeping

Housekeeping (good, average, poor): good

Comments (such as no dirt or trash was visible on the floors or the housekeeping was poor in that there was trash and debris on the floors that could lead to a tripping hazard, or there was dust in the vents.):

no trash, dirt etc.

3.0 Building Concerns

3.1 Ergonomic Concerns

Ergonomic concerns (Yes or No): NO

If there are ergonomic concerns at the armory, describe the extent of the problem, such as three employees stated that they perform repetitive motion at the XYZ machine for 6 hours per day, and they stated that they are suffering from symptoms of musculoskeletal disorders (MSDs).

N/A

3.2 Indoor Air Quality

IAQ concerns (based on employee interviews)(Yes or No): NO

If yes, what were concerns:

N/A

Measurements for carbon dioxide, humidity, and temperature:

Location	CO_2 (ppm)	Humidity (%)	Temperature (°F)	Occupancy (People in Room)
Outdoors - outside garage door	379	68.6	74.3	—
1st Floor - Classroom	403	61.9	78.4	1
2nd Floor -				
3rd Floor -				
Basement				

4.0 Safety and Industrial Hygiene Programs

4.1 Confined Spaces

Are confined spaces applicable (Yes or No): NO

If yes, does the program meet minimum standards (Yes or No): N/A

If no, explain the deficiencies:

N/A

4.2 Hearing Conservation

Is hearing conservation applicable (Yes or No): NO - vehical opperation requires hearing protection for selected vehicles during drill weekends

If yes, does the program meet minimum standards (Yes or No): N/A

If no, explain the deficiencies:

N/A

4.3 Respiratory Protection

Is respiratory protection applicable (Yes or No): NO

If yes, does the program meet minimum standards (Yes or No): N/A

If no, explain the deficiencies:

N/A

4.4 Hazard Communication

Is hazard communication applicable (Yes or No): Yes

If yes, does the program meet minimum standards (Yes or No): Yes flammable cabinet on premise w/ MSDS

If no, explain the deficiencies:

N/A

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4.5 Personal Protective Equipment

Is personal protective equipment applicable (Yes or No): Yes - supply sgt required to write steel toe boots,

If yes, does the program meet minimum standards (Yes or No): N/A Yes

If no, explain the deficiencies:

N/A

5.0 Ventilation

5.1 Ventilation System Evaluation

Local exhaust ventilation systems at this armory (Yes or No): NO

If yes, results of airflow patterns:

Location 1:

Airflow Pattern (acceptable or unacceptable, with reason):

Location 2:

Airflow Pattern (acceptable or unacceptable, with reason):

Location 3:

Airflow Pattern (acceptable or unacceptable, with reason):

5.2 Contamination of Clean Air Sources

Clean air sources contaminated by contaminated exhaust air (Yes or No): NO

If yes, describe:

N/A

6.0 Noise Dosimetry

Potential hazardous noise areas (Yes or No): NO

If yes, results of noise dosimetry sampling:

Employee sampled: _____

Results: _____% Actual _____% Projected 8-hour TWA _____ Equivalent dBA

Activity: _____

Employee sampled: _____

Results: _____% Actual _____% Projected 8-hour TWA _____ Equivalent dBA

Activity: _____

Employee sampled: _____

Results: _____% Actual _____% Projected 8-hour TWA _____ Equivalent dBA

Activity: _____

7.0 Lighting Evaluation

Location	Luminance Range (fc)
CoC Admin office	58.3-19.3
CoC CDR-/136 office	78.3-40.1
Kitchen (1 light out)	105.5-29.1
CoB Admin office	583-23.5
CoB RUCO office	58.0-29.1
Classroom	96.5-39.1

8.0 Converted Indoor Firing Ranges

Converted indoor firing range (Yes or No): Yes- ① CoC Supply Area (caged) + part of room

If yes, locations sampled:

② CoB Supply Area (lockers divide room)

Sample #: ___ Picture #: ___ Location: Inside any remaining ventilation ductwork * youth group storage in this section NOT APP

Sample #: ___ Picture #: ___ Location: Exhaust ventilation system NOT APP

Sample #: ___ Picture #: ___ Location: Bullet trap NOT APP (CAGED AREA ONLY)

Sample #: 7 Picture #: ___ Location: Light fixtures

Sample #: ___ Picture #: ___ Location: Overhead heaters NOT APPLICABLE

Sample #: 8/10 Picture #: ___ Location: Stored items 8 - CoC Supply Area 10 - CoB Supply Area - chiklen's youth center area (storage)

Sample #: 9 Picture #: ___ Location: Floor

Sample #: ___ Picture #: ___ Location: Outside the range - drill hall floor

9.0 HVAC System

Does the HVAC system have maintenance performed on a regular basis (Yes or No): NO

In yes, is the maintenance effective (Yes or No): NA

If no, describe:

NA

10.0 HHIM

Complete HHIM form for facility (Initial as completed): ___

Reproduction Room HHIM Necessary (Yes or No) (Initial if Yes): ___

Film Developing Room HHIM Necessary (Yes or No) (Initial if Yes): ___

Maintenance Area HHIM Necessary (Yes or No) (Initial if Yes): ___

11.0 Additional Items

Table 1 (wipe sampling) completed (initial when completed): M.S.
Table 2 (air sampling) completed (initial when completed): M.S.
Table 3 (peeling paint), if necessary, completed (initial when completed): M.S.
Table 3 or 4 (IAQ) completed (initial when completed): M.S.
Table 4 or 5 (noise), if necessary, completed (initial when completed): N/A
Table 5 or 6 (firing ranges), if necessary, completed (initial when completed): M.S.
Airflow pattern diagram(s) completed (initial when completed): N/A
Building layout included (initial when completed): M.S.
Photographs (initial when completed): M.S.
Sampling Sheets and Laboratory Analyses (initial when completed): M.S.
Sampling tracking form completed and faxed to NGB ARNG Region North III office within 5 days of date of this survey (initial when completed): M.S.
(Fax to Ken Forsythe at 410-942-0254)
State Lead Wipes Spreadsheet completed) (initial when completed): _____
Three copies of noise exposure notification letter, if necessary (initial when completed): N/A
Three copies of contaminant exposure forms for each employee that participated in air sampling (initial when completed): M.S.

N/A = not applicable.

Field Notes and Checklist

State: Vermont **Location:** Winooski **Date:** 5/9/08

Contact: [redacted]

1.0 Sampling for Lead

1.1 Wipe Sampling

VTWIN283

Sample #:	Picture #:	Location:
1		Assembly Room - next to laptop surface
2		bottom (AVOINVAN) adj to c.fr
3		locker (Boyle)
4		soda machine top
5		Fire alarm control box top
6		blank

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Industrial Hygiene Survey

Vermont Army National Guard (VT ARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Winooski Readiness Center
255 LaFountain Street
Winooski, VT 05404

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 28, 2011

AEI Project #: J11-601 4L VT Winooski RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

Table of Contents

List of Tables and Appendices

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Winooski Readiness Center located at 255 LaFountain Street, Winooski, VT 05404. Non-Responsive, CIH, CSP performed the evaluation on October 28, 2011. The point of contact for the facility was SSG Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the kitchen ceiling and on in the boiler room ceiling. Bulk paint chip samples were analyzed and found to contain 0.035% lead by weight in the kitchen and <0.0079% lead by weight in the boiler room. These concentrations of lead would not be considered lead-based paint by the Environmental Protection Agency (EPA) and the State of Vermont definitions. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for samples collected from a metal cabinet and a vent in the Drill Hall (260 and 470 µg/ft^2) and for samples collected in the former firing range (530 – 24,000 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged plaster and joint compound were observed in the boiler room. No asbestos was detected in either sample sent for analysis.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needs some improvement to reduce accumulated dust.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the janitor's closet only. The illumination measurements indoors ranged from 20 foot candles (fc) to 1,000 fc.

Indoor Air Quality: Temperature and relative humidity measurements were mostly within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 50.3° F and 22.6% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Emergency Eyewash and Shower Maintenance: Personal eyewash saline bottles were installed in the drill hall. There did not appear to be a reason such as risk of corrosive splashing for the saline bottles except for general first aid purposes. According to the latest guidance, ANSI Z358.1-2009,

eyewash saline will not provide enough fluid to meet flushing requirements of 15 minutes at 0.4 gallons per minute. The saline bottles have expiration dates that were not visible because the bottles were taped in place. The bottles should be readily accessible and the expiration dates should be clearly visible.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available, and the MSDSs were up to date as required by OSHA 29 CFR 1910.1200. Flammable storage cabinets were well organized.

Overall, the Winooski Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VT ARNG)
Winooski Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VT ARNG) Winooski Readiness Center located at 255 LaFountain Street, Winooski, VT 05404. Non-Responsive, CIH, CSP performed the evaluation on October 28, 2011. The point of contact for the facility was Non-Responsive SSG Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Winooski Readiness Center was built in the 1950s. The readiness center is staffed by 7 administrative personnel. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Winooski Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Winooski facility consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; potential ergonomic problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the ceilings of the kitchen and boiler room. Bulk paint chip samples were submitted to AMA Analytical Services, Inc. of Lanham, MD for lead analysis. The samples contained 0.035% lead by weight in the kitchen and <0.0079% lead by weight in the boiler room. These concentrations of lead would not be considered lead-based paint by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5%). To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the Commonwealth of Pennsylvania limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for samples collected from a metal cabinet and a vent in the Drill Hall (260 and 470 µg/ft^2) and for samples collected in the former firing range (530 – 24,000 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VT ARNG Winooski Readiness Center on October 28, 2011.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
WIN-01	Drill Hall – vending machine	<110
WIN-02	Drill Hall – dusty metal cabinet	**260**
WIN-03	Drill Hall – dusty wall vent	**470**
WIN-04	Drill Hall – floor near bay door	<110
WIN-05	Drill Hall – floor near former firing range	130
WIN-06	Former Firing Range – floor near door	<110
WIN-07	Former Firing Range – floor in bullet trap	**560**
WIN-08	Former Firing Range – painted baseboard heater	**24,000**
WIN-09	Former Firing Range – dusty metal cabinet	**530**

Table 1 – Results of Dust Wipe Sampling for VT ARNG Winooski Readiness Center on October 28, 2011.

Wipe Sample #	Sample Location	Result (µg/ft²)*
WIN-10	Kitchen – counter near microwave	<110
WIN-11	Exercise Equipment Room – weight bench	<110
WIN-12	Classroom – floor	<110
WIN-13	Classroom - desktop	<110

*The recommended maximum level for adult exposures is 200 µg/ft² lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged plaster and joint compound was observed in the boiler room. Samples of each damaged material were submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). No asbestos was detected in either sample.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement to reduce accumulated dust on surfaces.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on March 9, 2011, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the janitor's closet only. The illumination measurements indoors ranged from 20 foot candles (fc) to 100 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Plus Model 8554, factory calibrated in February, 2011. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30 and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 65.2 to 69.6° F and 31.9 to 44.8% Rh. Temperatures and relative humidity were mostly within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 50.3° F and 22.6% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 498 to 852 parts per million (ppm). CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.0 to 0.2 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Emergency Eyewash and Shower Maintenance: Personal eyewash saline bottles were installed in the drill hall. There did not appear to be a reason such as risk of corrosive splashing for the saline bottles except for general first aid purposes. According to the latest guidance, ANSI Z358.1-2009, eyewash saline will not provide enough fluid to meet flushing requirements of 15 minutes at 0.4 gallons per minute. The saline bottles have expiration dates that were not visible because the bottles were taped in place. The bottles should be readily accessible and the expiration dates should be clearly visible.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available, and the MSDSs were up to date as required by OSHA 29 CFR 1910.1200. Flammable storage cabinets were well organized.

7 Conclusions

The results of the evaluation indicated no concerns with the following at the facility: contamination of clean air sources, water intrusion, peeling potentially lead-based paints, noise hazards, visible mold and the presence of damaged asbestos-containing materials. The results of the evaluation indicated industrial hygiene concerns in the following areas: accumulated lead-containing dust in one area, lighting, and housekeeping. Overall, the Winooski Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

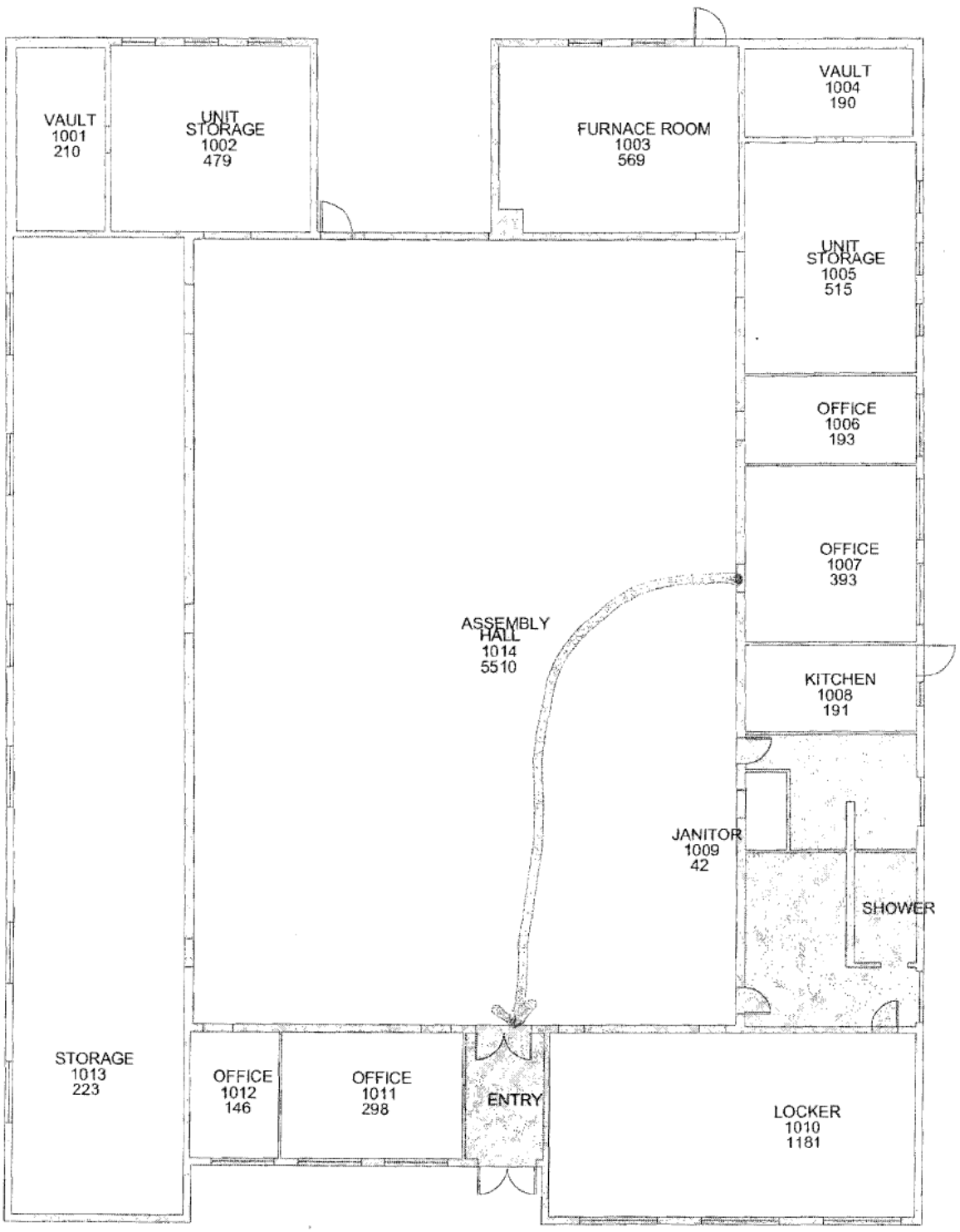
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 10 October 1997.

7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 28 March 2009.
8. Army Regulation (AR) 420-1 Army Facilities Management, 28 March 2009.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.

Appendix A
Building Layout



50B25 Winooski Armory Floor Plan

First Floor

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

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:**	Winooski RC	**Chain Of Custody:**	511728		
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Winooski, VT	**Date Submitted:**	11/1/2011		
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive		
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011	**Report Date:**	11/8/2011
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
12010526	Win-Blk-01	Flame	Paint Chip	****	N/A	0.0093	%Pb		0.035	%Pb	
12010527	Win-Blk-02	Flame	Paint Chip	****	N/A	0.0079	%Pb		<0.0079	%Pb	
12010530	Win-01	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010531	Win-02	Flame	Wipe	****	0.108	110	ug/ft²	28	260	ug/ft²	
12010532	Win-03	Flame	Wipe	****	0.056	220	ug/ft²	26	470	ug/ft²	
12010533	Win-04	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010534	Win-05	Flame	Wipe	****	0.108	110	ug/ft²	14	130	ug/ft²	
12010535	Win-06	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010536	Win-07	Flame	Wipe	****	0.108	110	ug/ft²	60	560	ug/ft²	
12010537	Win-08	Flame	Wipe	****	0.104	120	ug/ft²	2500	24000	ug/ft²	
12010538	Win-09	Flame	Wipe	****	0.108	110	ug/ft²	57	530	ug/ft²	
12010539	Win-10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010540	Win-11	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010541	Win-12	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
12010542	Win-13	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Winooski RC	**Chain Of Custody:**	511728
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Winooski, VT	**Date Submitted:**	11/1/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/7/2011 **Report Date:** 11/8/2011

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.

Ana Non-Responsive

Technical Manager: Non-Responsive

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Winooski RC	**Chain Of Custody:**	511728
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Winooski, VT	**Date Analyzed:**	11/8/2011
	Havre de Grace, Maryland 21078	**Job Number:**	J11-601	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
12010528	Win-Blk-03	NAD	--	--	--	--	--	--	TR	--	--	100	PL	Brown	Homogeneous	PC	
12010529	Win-Blk-04	NAD	--	--	--	--	--	--	--	--	--	100	JC	White	Homogeneous	PC	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

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

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

OM (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) **511728**

page 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-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: Winooski RC
2. Job Location: Winooski, VT
3. Job #: [redacted] W912K6-09-A-0003
4. Contact P[redacted]
5. Submitted [redacted]

Reporting Information (Results will be provi[redacted]

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: 11/8/11
- ❑ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

[redacted] REPORT TO: ...ith Report ...eriaenviro.com ...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 ④ (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 ② (QTY)
- ☒ Pb Dust Wipe (wipe type 10x10) ⑧ (QTY) (13 total)
- ❑ 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 (cm²)	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB
Win-blk-01	chip	10/28						X								
Win-blk-02	chip							X								
Win-blk-03	plaster						X									
Win-blk-04	Joint Comp.						X									
Win-01				100				X								
Win-02				100												
Win-03				51.6												
Win-04				100												
Win-05				100												
Win-06				100												
Win-07				100												
Win-08				96.8												

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: 11/1/11 @1015 Via: FedEx By (Print) [redacted]
2. Date/Time Analyzed: ____/____/____ @____ By (Print):
3. Results Reported To: ________ Via: ____
4. Comments: 7952 8773 2377 Time: ________ Initials: ____

OWI (410) 247-2024

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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 511728 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-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: Winooski RC
2. Job Location: Winooski, VT
3. Job #: JII-60
4. Contact Pe[redacted] PO #: W912K6-09-A-0003
5. Submitted [redacted]

Reporting Information (Results will be provid[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 +
☐ 2 Day Date Due:
☐ Results Required By Noon (Every Attempt Will Be Made to Accomodate)

REPORT TO:
☒ Incl[redacted] with Report
☒ [redacted] ...aria enviro.com
☐ 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 ____) 5 (QTY) (13 total)
☐ 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)

SAMPLE INFORMATION

CLIENT ID NUMBER	SAMPLE LOCATION/ IDENTIFICATION	DATE	VOLUME (LITERS)	WIPE AREA (cm²)	TEM	PCM	PLM	LEAD	MOLD	AIR	BULK	DUST	WATER	SPORE TRAP	TAPE	SWAB
Win-09		10/28		100				X								
Win-10		↓		↓				↓								
Win-11		↓		↓				↓								
Win-12		↓		↓				↓								
Win-13		↓		↓				↓								

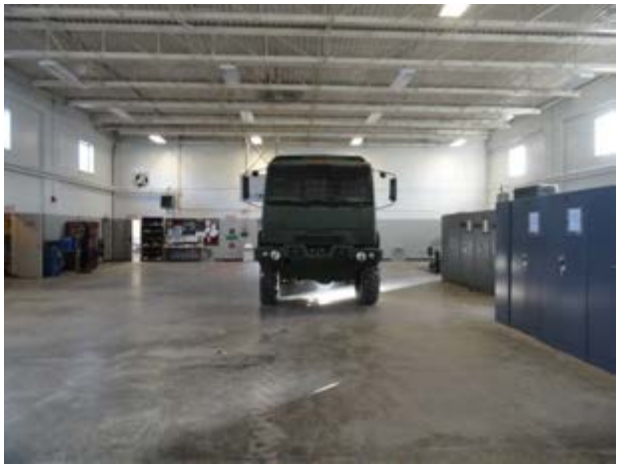
CLIENT CONTACT (LABORATORY STAFF ONLY)
Date/Time: Contact: By:
Date/Time: Contact: By:
Date/Time: Contact: By:

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: ___
4. Comments: ___ Initials: ___

Appendix C
Photo Documentation

Winooski, VT Readiness Center

Winooski RC Exterior



Drill Hall

Drill Hall

Classroom

Winooski, VT Readiness Center

Safety Equipment in Drill Hall

Fitness Area

Storage Area – former firing range

Storage Area – former firing range

Winooski, VT Readiness Center

Storage Area – former firing range

Ceiling of former firing range

Flammable storage cabinets

Storage Area

Winooski, VT Readiness Center

This room was locked.

Boiler Room

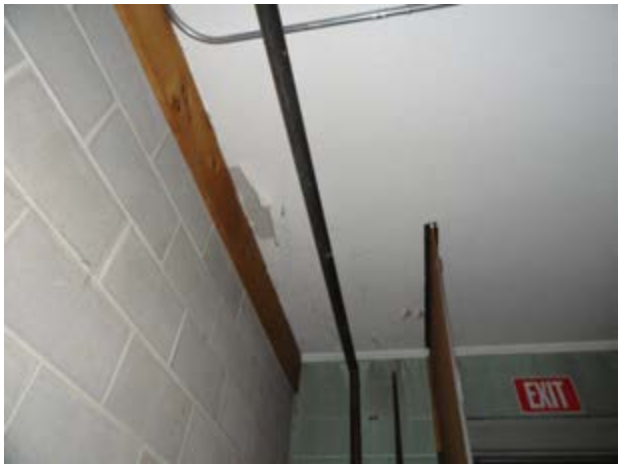
Boiler Room

Boiler Room

Winooski, VT Readiness Center

Boiler Room

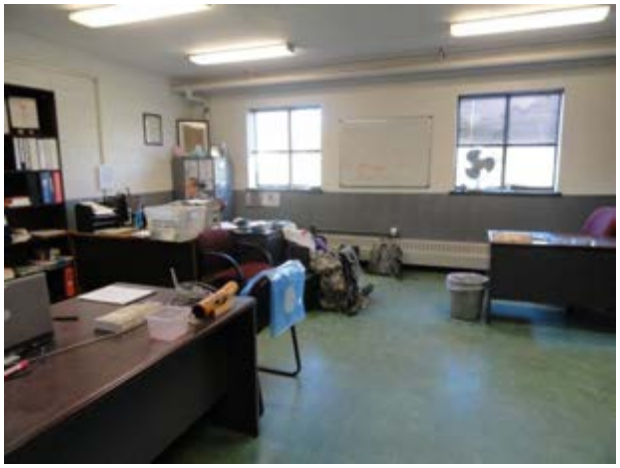
Flammable Storage Cabinets



Peeling Paint on Ceiling in Boiler Room

MSDS Station

Winooski, VT Readiness Center



Office

Kitchen

Peeling Paint in Kitchen

Kitchen

Winooski, VT Readiness Center

Women's Bathroom

Janitor's Closet Storage

MSDSs in Janitor's closet

AED and Eyewash Station

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Winooski	IAQ								Light		
Date	10/28/2011	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument		Cal-Light 400
Facility Description	RC			Serial Number		7565X0839020						Serial Number		K070003
Weather Conditions	Cool, Clear			Last Calibration		Feb-11						Last Calibration		9-Mar-11
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Room 14	Classroom	1	14:54	69.6		32.7		498		0.1		40-1000		30-50
Room 1	Office	1	15:31	68.7		31.9		574		0.2		35-52		30-50
Room 2	Office	1										40-70		30-50
Room 3	Storage	1	15:33	66.6	X	32.1		501		0.1		30-65		30
Drill Hall		1	15:34	65.2	X	32.6		507		0.0		30-1000		30-50
Room 4	Supply Storage	1	15:36									30		30
Room 5	Med Supply Office	2	15:37	69.4		44.8		852		0.1		30-50		30-50
Room 6	Boiler Room	1	15:38									30-70		30
Room 9	Office	2	15:39	69.1		33.5		577		0.0		30-60		30-50
Room 8	Office	1	15:39									30-60		30-50
Kitchen		1	15:40									50-100		50
Women's Bathroom		1	15:42									30-55		5
Janitor's Closet		1										20	X	30
Outside			12:02	50.3		22.6		429		1.2				

Industrial Hygiene Survey

Vermont Army National Guard (VTARNG)

Prepared For: NGB ARNG– Region North IH Office

Survey Location:

Winooski Readiness Center

255 LaFountain Street
Winooski, VT 05404

Prepared By: Aria Environmental, Inc. (AEI)
PO Box 286
Woodbine, MD 21797

Survey Date: October 26, 2012

AEI Project #: J12-685 3m VT Winooski RC

_____

Non-Responsive, **CIH, CSP**
Industrial Hygienist

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Winooski Readiness Center

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List of Tables and Appendices

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Winooski Readiness Center

Executive Summary

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Winooski Readiness Center located at 255 LaFountain Street, Winooski, VT 05404. Non-Responsive, CIH, CSP performed the evaluation on October 26, 2012. The point of contact for the facility was SSGNon-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities. The survey included: (1) ventilation system evaluations, noise dosimetry if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) photographs of the exterior and interior of the readiness center. The results of the evaluation indicated the following:

Paint Chip and Wipe Samples for Lead Contamination: A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the ceiling of the men's latrine, the wall in the boiler room and the older style window frames in Room 7. The samples contained from <0.006 to 0.27% lead by weight and would not be considered lead-based paint. Results of dust wipe samples taken throughout the facility were below the recommended maximum criterion for surface contamination of lead (200 micrograms per square foot (µg/ft^2)) in all areas sampled except for samples collected from three areas in the former firing range where concentrations approached or exceeded the maximum (190 – 1,200 µg/ft^2) and for one sample collected in the fitness area of the Drill Hall that approached the maximum (190 µg/ft^2).

Visual Inspection for Damaged Asbestos-Containing Materials: A visual inspection was performed to determine if there were any suspect asbestos-containing material and its condition. Damaged window caulk was observed in Room 7. No asbestos was detected in the sample sent for analysis.

Visual Inspection for Water Damage and Mold Growth: A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the survey. Moisture was observed around the older windows in Rooms 5 and 7.

Visual Inspection for Housekeeping Concerns: A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needs some improvement to reduce accumulated dust.

Lighting: A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in several areas. The illumination measurements indoors ranged from 5 foot candles (fc) to 80 fc.

Indoor Air Quality: Temperature and relative humidity measurements were all within the comfort ranges for the winter season on the day of the survey. The outdoor temperature and relative humidity were 64.2° F and 62.6% on the day of monitoring. Indoor concentrations of carbon dioxide (CO_2) and carbon monoxide (CO) were below the guidelines in all areas.

Emergency Eyewash and Shower Maintenance: Personal eyewash saline bottles were installed in the drill hall. There did not appear to be a reason such as risk of corrosive splashing for the saline bottles except for general first aid purposes. According to the latest guidance, ANSI Z358.1-2009,

eyewash saline will not provide enough fluid to meet flushing requirements of 15 minutes at 0.4 gallons per minute. The saline bottles expire in 2013 and should be replaced when they expire.

Personal Protective Equipment (PPE) Storage: The MSDS station on the back wall of the Drill Hall had dust masks available for staff. This station and the dust masks had an accumulation of dust on it. PPE such as dust masks, respirators and gloves should be stored in clean dry places and sealed in plastic bags to prevent contamination from dirt and dust per OSHA 29 CFR 1910.133 and 134.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available as required by OSHA 29 CFR 1910.1200. MSDSs require updating due to the Bravo Unit moving out.

Overall, the Winooski Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

Industrial Hygiene Survey Report
Vermont Army National Guard (VTARNG)
Winooski Readiness Center

1 Introduction

Aria Environmental, Inc. (AEI) was contracted to perform an industrial hygiene evaluation for the Vermont Army National Guard (VTARNG) Winooski Readiness Center located at 255 LaFountain Street, Winooski, VT 05404. Non-Responsive, CIH, CSP performed the evaluation on October 26, 2012. The point of contact for the facility was Non-Responsive SSG Non-Responsive. The purpose of the evaluation was to identify and measure the existence and extent of potentially hazardous operations or conditions at Army National Guard (ARNG) facilities.

The Winooski Readiness Center was built in the 1950s. The readiness center is staffed by 7 administrative personnel; however, the Bravo Unit was in the process of moving to another location and the staff will be reduced to 4 at that point. The operations conducted at the facility include supply and administrative duties. A diagram of the building layout is provided in Appendix A. All sampling sheets and laboratory certificates of analysis are provided in Appendix B. Selected photographs taken during the evaluation are provided in Appendix C. Indoor air quality and lighting survey measurement log sheets are provided in Appendix D. Lists of all references used during the evaluation are included in the main body of the report.

2 Evaluation Methods

The industrial hygiene survey of the Winooski Readiness Center consisted of visual inspections, interviews with employees, and sampling plan development in order to achieve the following: (1) evaluations of operations including operation description, sampling for lead in air or on surfaces if appropriate, ventilation system evaluations, noise measurements if appropriate, lighting surveys, hazard control evaluations and any additional information pertinent to the operations; (2) an evaluation of the physical condition of the facility and personnel concerns including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; indoor air quality concerns; and housekeeping practices; and (3) a building layout and photographic documentation of the interior of the facility.

The National Guard Bureau (NGB) Region North IH Office provided all industrial hygiene equipment for air sampling (equipment and media), ventilation, lighting, noise and indoor air quality (IAQ) survey instruments and paid for laboratory analytical fees. Laboratories were chosen or approved by the NGB IH office.

3 Operations

Operations conducted at the Winooski facility consist exclusively of supply and administrative duties. No maintenance of vehicles or other physical tasks are performed at the facility.

4 Noise Hazards

No noise-generating activities were taking place on the day of the survey. Due to the nature of the tasks performed onsite, no activities requiring noise monitoring are anticipated to occur at the RC.

5 Hazard Controls

Ventilation Systems

No local exhaust ventilation systems were present in the facility.

6 Physical Condition of the Facility and Personnel Concerns

An evaluation of the physical condition of the facility and personnel concerns was performed including visual inspections for peeling potentially lead-based paint, damaged suspect asbestos-containing materials, water damage or mold problems; and housekeeping practices. Lighting measurements were taken in all areas of the facility, and indoor air quality measurements were collected in select areas.

Paint Chip and Dust Wipe Samples for Lead Contamination

A visual inspection was performed to determine if there were any areas of peeling paint at the facility that could pose a lead exposure hazard. Peeling paint was observed on the ceiling of the men's latrine, the wall in the boiler room and the older style window frames in Room 7. Bulk paint chip samples were submitted to AMA Analytical Services, Inc. of Lanham, MD for lead analysis. The samples contained from <0.006 to 0.27% lead by weight and would not be considered lead-based paint by the Environmental Protection Agency (EPA) and State of Vermont definitions (>0.5%). To determine if any cross contamination of lead from any source into areas of the facility existed, wipe samples were collected using ghost wipes and 10 centimeter (cm) x 10cm templets. The Environmental Protection Agency (EPA) and the State of Vermont limits for lead in dust are 40 micrograms per square foot (µg/ft^2) on floors, 250 µg/ft^2 on window sills, and 400 µg/ft^2 in window troughs. These limits apply to pre-1978 Army facilities only if children under 6 years of age occupy them for 60 or more hours per year. The NGB Region North Industrial Hygiene Office concurs with the US Army Public Health Command recommended maximum level for adult exposures of 200 µg/ft^2 on floors and frequently contacted surfaces, which is more stringent for window sills than the EPA/State standards. Dust wipe samples were submitted to AMA for atomic absorption spectrophotometry (AAS) following the analytical method ASTM D3335-85A. All wipe samples collected from the facility were below the recommended maximum except for samples collected from three areas in the former firing range where concentrations approached or exceeded the maximum (190 – 1,200 µg/ft^2) and for one sample collected in the fitness area of the Drill Hall that approached the maximum (190 µg/ft^2). Results are given in Table 1 and certificates of analysis are included in Appendix B.

Table 1 – Results of Dust Wipe Sampling for VTARNG Winooski Readiness Center on October 26, 2012.

Wipe Sample #	Sample Location	Result (µg/ft^2)*
WNSK-01	Former Firing Range – floor in bullet trap area	**190**
WNSK-02	Former Firing Range – dusty metal shelf panels on floor	<110
WNSK-03	Former Firing Range – floor at firing end	**1,200**
WNSK-04	Former Firing Range – center of floor	**250**
WNSK-05	Drill Hall – floor near former firing range	<110
WNSK-06	Drill Hall – fitness area – floor mat	**190**
WNSK-07	Drill Hall – fitness area – lifting bench	<110
WNSK-08	Drill Hall – center of floor	<110
WNSK-09	Drill Hall – top of shipping container	<110

Table 1 – Results of Dust Wipe Sampling for VTARNG Winooski Readiness Center on October 26, 2012.

Wipe Sample #	Sample Location	Result (µg/ft²)*
WNSK-10	Kitchen – counter near sink	<110

*The recommended maximum level for adult exposures is 200 micrograms per square foot (µg/ft²) lead on surfaces.

Visual Inspection for Damaged Asbestos-Containing Materials

A visual inspection was performed to determine if there was any damaged suspect asbestos-containing material (ACM). Damaged window caulk was observed on older style windows in Room 7. A sample was submitted to AMA Analytical Services, Inc. of Lanham, MD 20706 (NIST-NVLAP Accreditation No. 101143-0) for analysis by Polarized Light Microscopy (PLM). No asbestos was detected in the sample.

Visual Inspection for Water Damage and Mold Growth

A visual inspection was performed to determine if there was any water damage or visible mold growth at the facility. No water damage or evidence of mold growth was observed on the day of the inspection. Some moisture was observed around older style windows in Rooms 5 and 7.

Visual Inspection for Housekeeping Concerns

A visual inspection was performed to assess the state of housekeeping in the facility. The housekeeping needed some improvement to reduce accumulated dust on surfaces.

Lighting

Illumination levels were measured using a Cal-Light 400L, calibrated on April 16, 2012, and compared to minimum lighting requirements for various facilities and functions based on the following references: American National Standards Institute/Illumination Engineering Society of North America (ANSI/IESNA) Standard RP-1-04 (Office Lighting) and ANSI/IESNA Standard RP-7-01 (Lighting Industrial Facilities).

A lighting survey was performed in all areas within the readiness center. The evaluation indicated illumination deficiencies in the janitor's closet only. The illumination measurements indoors ranged from 5 foot candles (fc) to 80 fc. The complete results of the evaluation are presented in Appendix D, including whether the results met minimum requirements for illumination.

Indoor Air Quality (IAQ)

Indoor air quality measurements (i.e., temperature, relative humidity, carbon dioxide and carbon monoxide) were taken using a TSI Q-Trak Model 7656X, factory calibrated in March, 2012. Temperature, relative humidity and carbon dioxide (CO_2) measurements were compared to the recommended levels established by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Carbon monoxide (CO) concentrations were compared to the ACGIH Threshold Limit Value (TLV) for CO and the Environmental Protection Agency's (EPA's) National Ambient Air Quality Standard (NAAQS) for CO.

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by ASHRAE standard 55-2010. These ranges are presented in Table 2. The U.S. EPA also recommends maintaining relative humidity below 60% and ideally between 30

and 50% to prevent mold growth. Complete results are provided in Appendix D with the lighting survey measurements.

Table 2 - Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter[a]

Relative Humidity	Winter Temperature	Summer Temperature
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F – 75.5°F	73.5°F – 79.5°F
50%	68.5°F – 74.5°F	73.0°F – 79.0°F
60%	68.0°F – 74.0°F	72.5°F – 78.0°F

[a]adapted from ASHRAE Standard 55-2010

Temperature and Relative Humidity
Indoor temperature and relative humidity (Rh) measurements in the facility ranged from 68.3 to 72.0° F and 49.8 to 58.8% Rh. Temperatures and relative humidity were all within the winter comfort ranges in the areas monitored. The outdoor temperature and relative humidity was 64.2° F and 62.6% on the day of monitoring.

Carbon Dioxide (CO_2) and Carbon Monoxide (CO)
Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build up of CO_2 indicates inadequate ventilation. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2010 as 700 ppm above outdoor concentrations. Indoor levels of CO_2 ranged from 402 to 565 parts per million (ppm), and the outdoor measurement was 385 ppm. CO_2 measurements were below the guideline in all areas monitored, indicating adequate fresh air exchange.

Carbon monoxide is a byproduct of incomplete combustion. Indoor concentrations indicate contamination caused by improperly vented or malfunctioning boilers, furnaces or stoves or from vehicle exhaust entering the building from garages, loading docks, nearby roads or parking lots. The concentration of interest set by ASHRAE standard 62.1-2010 and the National Ambient Air Quality Standards (NAAQS) for carbon monoxide is an 8 hour average of 9 ppm. The ACGIH TLV for CO is 25 ppm. Indoor levels of CO ranged from 0.1 to 0.6 ppm; therefore, concentrations are below occupational exposure limits, ASHRAE and the NAAQS-recommended CO concentrations.

Additional Information

Emergency Eyewash and Shower Maintenance: Personal eyewash saline bottles were installed in the drill hall. There did not appear to be a reason such as risk of corrosive splashing for the saline bottles except for general first aid purposes. According to the latest guidance, ANSI Z358.1-2009, eyewash saline will not provide enough fluid to meet flushing requirements of 15 minutes at 0.4 gallons per minute. The saline bottles expire in 2013 and should be replaced when they expire.

Hazard Communication Program and Material Safety Data Sheets (MSDSs): A written hazard communication program was readily available as required by OSHA 29 CFR 1910.1200; however, MSDSs need updating due to the Bravo Unit moving out.

Personal Protective Equipment (PPE) Storage
The MSDS station on the back wall of the Drill Hall had dust masks available for staff. This station and the dust masks had an accumulation of dust on it. PPE such as dust masks, respirators and gloves should be stored in clean dry places and sealed in plastic bags to prevent contamination from dirt and dust per OSHA 29 CFR 1910.133 and 134.

7 Conclusions

The results of the evaluation indicated few concerns at the facility. Overall, the Winooski Readiness Center has few industrial hygiene issues, and programs are in place to protect, inform and train employees and maintain the facility.

8 Limitations

This report has been prepared for the exclusive use of the U.S. Army National Guard (USARNG) and/or their agents. This service has been performed in accordance with generally accepted industrial hygiene and environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards.

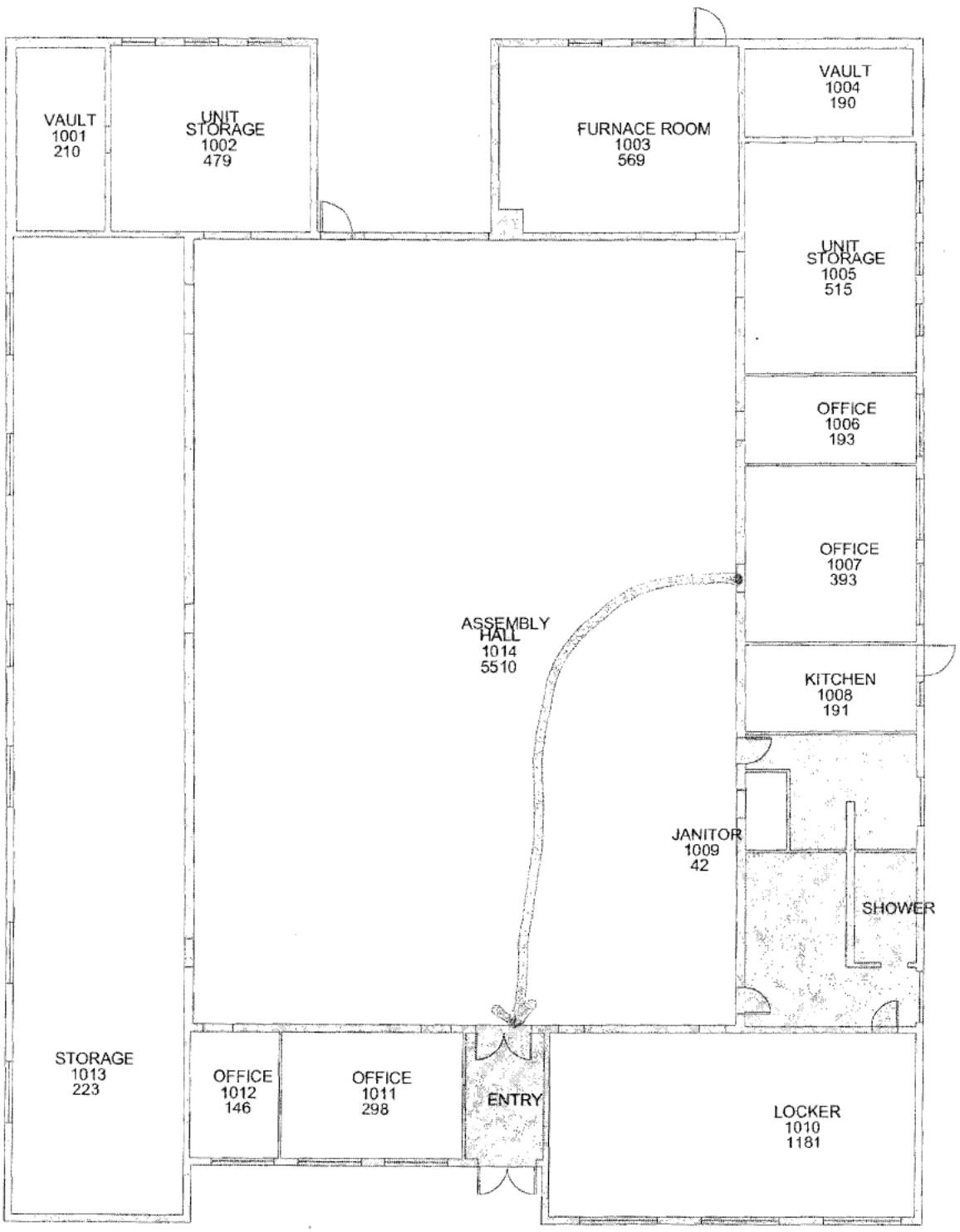
By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that my present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

9 References

1. Title 29, Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Administration, current edition.
2. Title 24, Code of Federal Regulations (CFR), Part 35, Subpart B, Sections 35.110, Definitions of Lead-Based Paint, Housing and Urban Development, U.S. Department of Housing.
3. Department of Defense Instruction (DODI) 6055.1, Department of Defense Occupational Safety and Health (OSH) Program, August 19, 1998.
4. Army Regulation (AR) 40-5, Medical Service, Preventive Medicine, May 25, 2007.
5. Army Regulation (AR) 385-10, The Army Safety Program, 4 October 2011.
6. Army Regulation (AR) 420-70 Buildings and Structures, 11 November 1997.
7. Army Regulation (AR) 200-1 Environmental Protection and Enhancement, 13 December 2007.

8. Army Regulation (AR) 420-1 Army Facilities Management, 12 February 2008, RAR 24 August 2012.
9. Department of the Army Pamphlet (DA PAM) 40-501, Medical Service, Hearing Conservation Program, December 10, 1998.
10. Department of the Army Pamphlet (DA PAM) 40-503, Medical Service, Industrial Hygiene Program, October 30, 2000.
11. Technical Manual (TM) 5-810-1, Mechanical Design, Heating, Ventilation, and Air Conditioning, June 1991.
12. Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs), American Conference of Governmental Industrial Hygienists (ACGIH), current edition.
13. RP-1-2004 (Office Lighting) and RP-7-2001 (Industrial Lighting), Illuminating Engineering Society of North America (IESNA)/ANSI.
14. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Standard 62.1-2010, "Ventilation for Acceptable Indoor Air Quality" and Standard 55-2010, "Thermal Environmental Conditions for Human Occupancy".
15. NIOSH website: http://www.cdc.gov/niosh/.
16. OSHA website: http://www.osha.gov/.
17. Army Public Health Command website: http://phc.amedd.army.mil/Pages/default.aspx.
18. EPA website: http://www.epa.gov.
19. ANSI Z358.1 – 2009, Emergency Eyewash and Shower Equipment.

Appendix A
Building Layout



50B25 Winooski Armory Floor Plan

First Floor

Appendix B
Certificates of Analysis for Dust Wipe and Bulk Samples

AMA Analytical Services, Inc.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

Client:	National Guard Bureau	**Job Name:**	Winooski RC	**Chain Of Custody:**	514384
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Winooski, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/12/2012 **Report Date:** 11/12/2012

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
13010917	WNSK-W 01	Flame	Wipe	****	0.108	110	ug/ft²	21	190	ug/ft²	
13010918	WNSK-W 02	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010919	WNSK-W 03	Flame	Wipe	****	0.108	110	ug/ft²	130	1200	ug/ft²	
13010920	WNSK-W 04	Flame	Wipe	****	0.108	110	ug/ft²	27	250	ug/ft²	
13010921	WNSK-W 05	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010922	WNSK-W 06	Flame	Wipe	****	0.108	110	ug/ft²	21	190	ug/ft²	
13010923	WNSK-W 07	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010924	WNSK-W 08	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010925	WNSK-W 09	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010926	WNSK-W 10	Flame	Wipe	****	0.108	110	ug/ft²	<12	<110	ug/ft²	
13010927	WNSK-Bulk 01	Flame	Paint Chip	****	N/A	0.006	%Pb		<0.006	%Pb	
13010928	WNSK-Bulk 02	Flame	Paint Chip	****	N/A	0.0066	%Pb		0.27	%Pb	
13010929	WNSK-Bulk 03	Flame	Paint Chip	****	N/A	0.0072	%Pb		0.18	%Pb	

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:**	Winooski RC	**Chain Of Custody:**	514384
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Winooski, VT	**Date Submitted:**	11/2/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003	**Date Analyzed:**	11/12/2012 **Report Date:** 11/12/2012

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.

A Specialized Environmental Laboratory

CERTIFICATE OF ANALYSIS

NVLAP 101143-0

Client:	National Guard Bureau	**Job Name:**	Winooski RC	**Chain Of Custody:**	514384
Address:	301-IH Old Bay Lane, Attn: ARNG-CJG-P, State Military Reservation	**Job Location:**	Winooski, VT	**Date Analyzed:**	11/8/2012
	Havre de Grace, Maryland 21078	**Job Number:**	J12-685	**Person Submitting:**	Non-Responsive
		P.O. Number:	W912K6-09-A-0003		

Attention: Non-Responsive

Summary of Polarized Light Microscopy

AMA Sample Number	Client Sample #	Total Asbestos	Chrysotile Percent	Amosite Percent	Crocidolite Percent	Other Asbestos Percent	Mineral Wool Percent	Fiberglass Percent	Organic Percent	Synthetic Percent	Other Percent	Particulate Percent	Sample Type	Sample Color	Homogeneity	Analyst ID	Comments
13010930	WNSK-Bulk 04	NAD	--	--	--	--	--	--	--	--	TR	100	CK	White	Homogeneous	SW	

The following footnotes only apply to those samples which the total asbestos result is flagged with a note number.

1 TEM RECOMMENDATION - Please note, due to resolution limitations with optical microscopy and/or interference from matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos. It is recommended that the additional analytical technique of TEM be used to check for asbestos fibers below the resolution limits of optical microscopy.

2 MATRIX REDUCTION RECOMMENDATION - Please note, due to interference from the matrix components of this sample, results which are reported via PLM as negative or trace (<1%) for asbestos may contain a significant quantity of asbestos which is obscured from view. It is recommended that the additional preparation technique of gravimetric reduction be performed on this sample to minimize the obscuring effects of matrix components, followed by reanalysis by PLM and/or TEM.

Analysis Method - EPA/600/R-93/116 dated July 1993

NAD = "No Asbestos Detected" TR = "Trace equals less than 1% of this component"

Uncertainty: For samples containing asbestos in range of 1-10% the CV is 0.43, 11-35% CV=0.55, >35 CV=0.23

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

Technical Director Non-Responsive **Analyst(s)** Non-Responsive

AMA Analytical Services, Inc.
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CHAIN OF CUSTODY

(Please Refer To This Number For Inquires)

514384

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: Winooski RC
2. Job Location: Winooski, VT
3. Job #: J12-685 P.O. #: W912K6-09-A-0003
4. Contact Perso[redacted] @[redacted]
5. Submitted by[redacted] ature:[redacted]

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ Immediate Date Due:	❑ Immediate ❑ 3 Day	☒ Inclu[redacted] ith Report
❑ 24 Hours Time Due:	❑ Next Day ☒ 5 Day + 11/9/12	☒ Emai[redacted] ariaenviro.com
Comments:	❑ 2 Day Date Due:	❑ Fax: [redacted] us.army.mil
	❑ Results Required By Noon	❑ 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 1 (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)

*It is recommended that blank samples be submitted with all air and surface samples

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)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ❑ Pb Paint Chip 3 (QTY)
- ☒ *Pb Dust Wipe (wipe type 10X10 cm) 10 (QTY) ghost
- ❑ *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)

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL. (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	FUNGAL: AIR	BULK	DUST	MATRIX: WATER AND OTHER	SPORE TRAP	TAPE	SWAB
	SEE ATTACHED FIELD DATA SHEETS														

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: 11/2/12 @ Via: FedEx By (Print[redacted]
2. Date/Time Analyzed: / / @ By (Print):
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: 7957 2722 092

Aria Environmental, Inc

SURFACE WIPE AND BULK SAMPLING SURVEY SHEET

Date Collected: 10/26-12

Job Site: Winooski RC

Project No.: J12-685

Inspector: Non-Responsive

10 X 10 cm

Sample No.	Sample Type	Sample Location	Dimensions (Area)
WNSK-W01	FIFR	Storage Room - former bullet trap side - floor	
W02	"	" - dusty shelf panels (metal) (studded)	
W03	"	" - floor - firing end	
W04	"	" - center of floor	
W05		Drill Hall - floor near FIFR (painted concrete)	
W06		Drill Hall - fitness area - dirty floor mat	
W07		Drill Hall - fitness area - lifting bench	
W08		Drill Hall - center of floor	
W09		Drill Hall - top of shipping container	
W10		Kitchen - counter near sink	
WNSK-bulk-01 (Lead)		peeling paint in Mens Latrine (ceiling)	
WNSK-bulk-02 (Lead)		peeling paint in Boiler Room (Gray)	
WNSK-bulk-03 (Lead)		peeling paint from old windows in Room 7	
WNSK-bulk-04 (Ash)		Window caulk from Room 7	

Appendix C
Photo Documentation

VT Winooski RC

Front exterior

Side exterior

Drill Hall

Drill Hall

VT Winooski RC

Drill Hall

MSDS and PPE Station

Boiler Room

Boiler Room

VT Winooski RC

Same peeling paint and broken plaster as 2011 Survey

New peeling paint

Office

Drill Hall view into offices

VT Winooski RC

Kitchen

Same peeling paint as 2011 survey

Women's latrine and shower room

Janitor's closet

VT Winooski RC

Janitor's closet

Janitor's closet

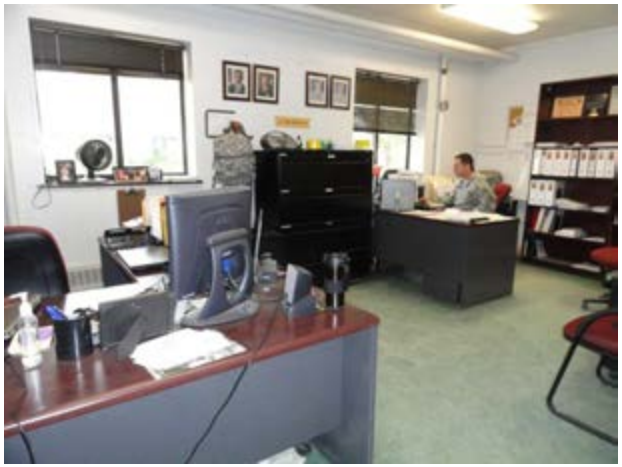
Classroom

Shower

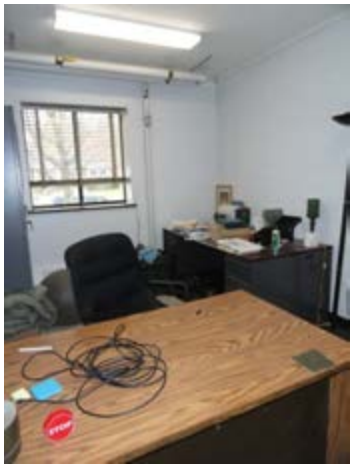
VT Winooski RC

Men's latrine

Peeling paint in men's latrine



Office



Office

VT Winooski RC

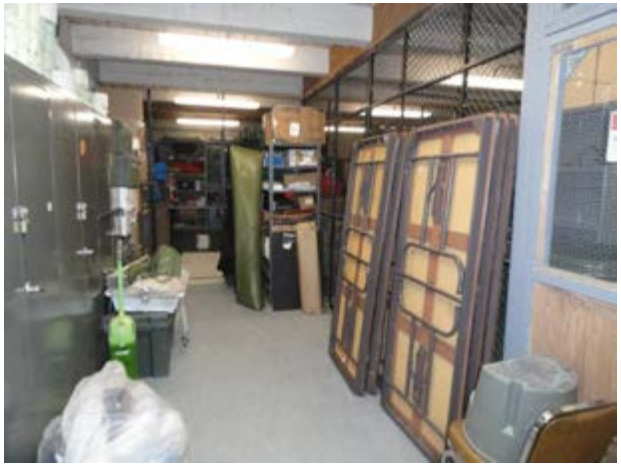
Medical practice victims

Storage and former range

Storage and former range

Storage and former range

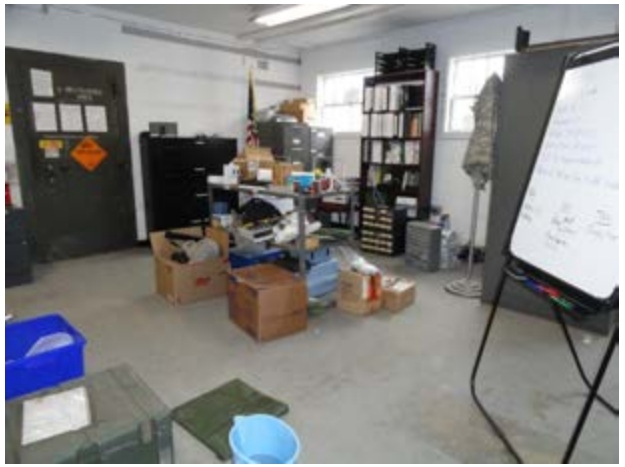
VT Winooski RC



Storage and former range

Storage and former range

Supply room



Office

VT Winooski RC

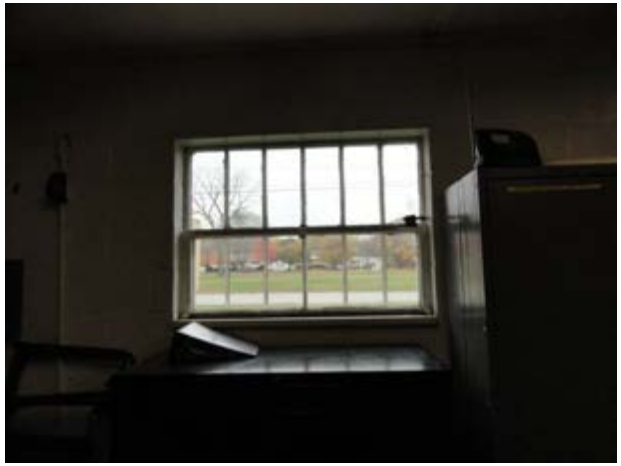
Deteriorating glaze and paint on windows

Deteriorating glaze and paint on windows

Office

Office

VT Winooski RC



Only a couple rooms had these older style windows

Personal saline eyewash station

Appendix D
IAQ and Lighting Survey Log Sheets

National Guard Industrial Hygiene Survey For Indoor Air Quality and Light Level

State	Vermont	City	Winooski	IAQ								Light	
Date	10/26/2012	Inspector	Non-Responsive	Instrument		Q-trak 7565-X						Instrument	Cal-Light 400
Facility Description	Winooski RC			Serial Number		7565X0839019						Serial Number	K070003
Weather Conditions	Cool and Cloudy			Last Calibration		Mar-12						Last Calibration	16-Apr-12
Location/Function		No. Occupants	Time	Temp. (°F)	Exceeded	RH (%)	Exceeded	CO_2 (ppm)	Exceeded	CO (ppm)	Exceeded	Illuminance (fc)	Insufficient	Illuminance Reference (fc)
Drill Hall		1	1108	69.2		52.8		429		0.6		30-40	X	50
Boiler Room 6		1	1110	71.1		51.5		415		0.2		8-33	X	30
Room 8 Offices		1	1114	70.7		51.3		482		0.5		46-70		30-50
Room 9 Offices		4	1116	71.4		50.9		565		0.5		30-80		30-50
Kitchen 10		1	1117	70.9		50.6		457		0.2		50-70		50
Women's Latrine and Shower 11		1	1118	72.0		58.8		440		0.1		20-40		7
Janitor's Closet 12		1	1120									10-15	X	30
Classroom 14		2	1125	70.7		49.8		450		0.2		16-38	X	30-50
Men's Latrine and Shower 13		1	1126	70.4		55.9		438		0.2		18-75		7
Room 1 Offices		2	1132	69.7		51.1		451		0.2		15-45	X	30-50
Room 2 Offices		1	1133	69.9		50.3		446		0.3		20-40	X	30-50
Room 3 Storage		1	1135	68.3		50.6		438		0.2		30-80		30
Room 4 Supply Storage		1	1138	68.6		50.3		402		0.1		5-70	X	30
Room 5 Supply Storage		3	1140	69.3		54.3		474		0.2		16-42	X	30
Room 7 unit Supply Room		2	1144	68.9		52.9		502		0.1		30-40		30
Outside		1	1233	64.2		62.6		385		0.4				

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