



Occupational Hygiene Airborne Lead Monitoring Survey

The Recreation Association
2451 Riverside Drive, Ottawa, Ontario

Prepared for:

The Recreation Association

2451 Riverside Drive
Ottawa, ON K1H 7X7

Attn: Ross Rankin
Director, Facility and Property Services

February 11, 2019

Pinchin File: 222303.001



Issued to: The Recreation Association
Contact: Ross Rankin
Director, Facility and Property Services
Issued on: February 11, 2019
Pinchin File: 222303.001
Issuing Office: Kanata, ON
Pinchin Contact: Neil Box
Senior Project Manager

Author:

Neil Box, B.A. (Hons), EMAPG, C-NRPP
Senior Project Manager
613.592.3387 ext. 1811
nbox@pinchin.com

Reviewer:

Ryan Mallard, B.Sc., DIHT, C.Chem., CRSP, CIH
Operations Manager
905.363.1354
rmallard@pinchin.com



EXECUTIVE SUMMARY

Pinchin Ltd., conducted an airborne lead monitoring survey at the Recreation Association (RA) Centre located at 2451 Riverside Drive, Ottawa, Ontario. Sampling of lead was completed during four different firing range activities: International Sport Shooting Federation (ISSF) activity on November 14, 2018; International Practice Shooting Confederation (IPSC) activity on November 15, 2018; Rifle activity on November 16, 2018; and Handgun activity on November 19, 2018. The objectives of this survey were to evaluate potential Range Officer and other range participant lead exposures during representative firing range conditions and to evaluate the results of testing against the regulated occupational exposure limit (OEL) for airborne lead. This report summarizes the survey activities, the results of the air monitoring, and our conclusion regarding exposure potential.

Personal samples of airborne lead were taken during each of the four firing range activities. The results of testing indicate personal exposures to airborne lead were below the applicable OEL and also half of the OEL on all samples collected under range activities conducted on November 14, 15, 16, and 19, 2019. Based on the results of this survey, firing activities could occur for a full 4-hour period for both Range Officers and participants without exceeding half of the OEL.

Recommendations are provided regarding practicing good personal hygiene.



TABLE OF CONTENTS

1.0 INTRODUCTION..... 1

2.0 METHODOLOGY..... 1

 2.1 Sampling Strategy 1

3.0 OCCUPATIONAL EXPOSURE LIMIT 2

 3.1 Air Monitoring..... 2

4.0 RESULTS AND CONCLUSIONS 3

 4.1 Summary of Site Activities 3

 4.2 Field Observations..... 3

 4.3 Air Monitoring..... 3

5.0 RECOMMENDATIONS..... 4

6.0 REFERENCES..... 5

7.0 TERMS AND LIMITATIONS 5

8.0 CLOSURE 6

APPENDICES

APPENDIX A Results of Air Monitoring

APPENDIX B Maxxam Analytical Laboratory Report



1.0 INTRODUCTION

At the request of Ross Rankin, Director, Facility and Property Services with The Recreation Association of Public Services of Canada (RA Centre), an airborne lead monitoring survey was conducted at the RA Centre located at 2451 Riverside Drive, Ottawa, Ontario by Pinchin Ltd. (Pinchin). The survey was completed by Neil Box and Jack Dulmage of Pinchin during four separate firing range activities: International Sport Shooting Federation (ISSF) activity on November 14, 2018 International Practice Shooting Confederation (IPSC) activity on November 15, 2018; Rifle activity on November 16, 2018; and Handgun activity on November 19, 2018. The objectives of this survey were to evaluate potential Range Officer and other range participant lead exposures during representative firing range conditions and to evaluate the results of testing against the regulated occupational exposure limit (OEL) for lead. This report summarizes the survey activities, the results of the monitoring, and our conclusion regarding exposure potential.

2.0 METHODOLOGY

2.1 Sampling Strategy

The sampling strategy was developed by Neil Box, of Pinchin and is largely based on the March and April 2016 Pinchin survey conducted at the RA Centre (Pinchin File 112516) and the most recent survey completed in April and June 2018 (Pinchin File 222303). The air sampling strategy is summarized in Table 1.

The samples of airborne lead were taken and analyzed in accordance with Method 7303, published in the National Institute for Occupational Safety and Health (NIOSH), *Manual of Analytical Methods*. Blank samples (i.e. collection filters which had no workplace air drawn through them) were also submitted from each day of the survey for quality control purposes. The airborne lead samples and the blanks were analyzed by Maxxam, an American Industrial Hygiene Association (AIHA) accredited laboratory. All air sampling pumps were calibrated before and after the monitoring periods on all days of the survey.

The personal samples of lead were collected by asking the Range Officers and other range participants to wear the air sampling equipment during firing range activities. The air sampling pumps were attached to their belts and the collection filter cassettes were placed onto their shirt lapels which were connected to the air sampling pumps by flexible tubing. The personal air sampling equipment was removed at the conclusion of the firing range activities.



Table 1 – Air Sampling Strategy

Location	Agent Monitored	Source of Exposure	Sampling and Analytical Method	Sample Description
International Sport Shooting Federation (ISSF) Activity – November 14, 2018				
Basement Range	Lead	Weapon discharging	NIOSH Method 7303	Two long-term personal samples (one on an officer and another on a participant) and three short-term personal sample on a participant during weapon discharging tasks.
International Practice Shooting Confederation (IPSC) Activity – November 15, 2018				
Basement Range	Lead	Weapon discharging	NIOSH Method 7303	Two long-term personal samples (one on an officer and another on a participant) and two short-term personal samples on two participants during weapon discharging tasks.
Rifle Activity – November 16, 2018				
Basement Range	Lead	Weapon discharging	NIOSH Method 7303	Two long-term personal samples (one on an officer and another on participant) and three short-term personal samples on three participants during weapon discharging tasks.
Handgun Activity – November 19, 2018				
Basement Range	Lead	Weapon discharging	NIOSH Method 7303	Two long-term personal samples (one on an officer and another on participant) and three short-term personal samples during weapon discharging tasks (two participants).

3.0 OCCUPATIONAL EXPOSURE LIMIT

3.1 Air Monitoring

The Ontario Occupational Health and Safety Act defines a designated substance as a biological, chemical or physical agent, or combination of agents to which the exposure of a worker is prohibited, regulated, restricted, limited, or controlled by a specific regulation. Lead is a designated substance in Ontario.

The Ontario *Designated Substances Regulation (O. Reg. 490/09)*, states that the employer shall take all necessary measures and procedures by means of engineering controls, work practices and hygiene facilities and practices to ensure that a worker’s exposure to airborne lead does not exceed the 0.05 milligrams of lead per cubic meter of air (0.05 mg/m³) time-weighted average (TWA) limit which is set out in *O. Reg. 490/09*. TWA limits are maximum allowable exposures averaged over an 8-hour workday.



4.0 RESULTS AND CONCLUSIONS

4.1 Summary of Site Activities

On each day of the survey, Mr. Box or Mr. Dulmage met with, and discussed the sampling strategy with, Mr. Rankin, the Range Officers, and other various range participants.

The survey was performed during typical evening shift operating and environmental conditions on all days of the survey. Mr. Rankin reported that the Range Officers typically work a three to four hour shift at the RA Centre once per month and that the range participants would conduct firing activities for less than 4 hours.

4.2 Field Observations

The following field observations were made by Mr. Box during the survey:

- The facility doors were closed.
- The firing range supply and exhaust air ventilation systems were operational during all firing range activities.
- All range members wore hearing protection and safety glasses.
- Signs warning that “No food or drink are allowed” were posted on the doors to areas where lead may be handled.
- Sticky mats were present at the exit of the range.
- Most of the members washed their hands after relays and before they left for the evening. However some members did not wash their hands.
- Paper targets used for the ISSF activity are stored inside the lunch room. Members were observed taking them out at the beginning and returning them at the end of the session.
- During the Rifle activity on November 16, a member was observed using a table in the lunch room to remove staples from strapping used for targets in the range. No gloves or drop sheets were used, and the table was not cleaned by the member afterwards.

4.3 Air Monitoring

The air monitoring results are presented in Tables A1 to A4 of Appendix A and the Maxxam analytical laboratory report is provided in Appendix B. The results are presented as “Average Airborne Concentrations” as measured over the sampling period and “8-Hour Time-Weighted Average (TWA) Exposures”. The 8-hour TWA Exposure adjusts exposure levels to account for work periods that are less than the standard 8-hour work day, such as the four-hour shift for the Range Officers. This adjustment is



required under *O. Reg. 490/09*. The 8-hour Time-Weighted Average Exposures of the Range Officers and the volunteer range participants were calculated assuming four hours of exposure (i.e. reported maximum duration of firing activities) at the measured concentrations and no further exposure to lead during an 8-hour period.

It should be noted that extrapolating results of air monitoring during one scenario to different conditions is difficult and must be done with caution as exposure levels will vary with changing work conditions (e.g. greater number of shots fired and/or greater exposure times, different guns or different ammunition). The NIOSH reports that "a single day exposure measurement as low as one-half the exposure standard indicates sufficient probability of an employee's exposure exceeding the standard on other days". Therefore, it is recommended that personal exposures to airborne lead be maintained below half of the 0.05 mg/m³ OEL, knowing that exposures above half of the OEL may result in exposures above the OEL on other days.

The results of this survey indicate that 8-hour TWA exposures to airborne lead (calculated based on 4 hours of exposures) ranged from less than detectable level (i.e. less than 0.00041 mg/m³) to 0.022 mg/m³, and were below the applicable 0.5 mg/m³ OEL and 0.025 mg/m³ (i.e. half of the OEL) on all samples collected under range activities conducted on November 14, 15, 16, and 19, 2019. Based on the results of this survey, firing activities could occur for a full 4-hour period for both Range Officers and participants without exceeding the OEL or half of the OEL.

The results of this survey were lower than (for IPSC activity) or similar to (for ISSF, Rifle, and Handgun activities) the airborne levels of lead measured during the previous Pinchin survey (file number 222303), conducted in April and June 2018.

5.0 RECOMMENDATIONS

The following recommendations are provided:

1. Although surface lead sampling was not conducted during this survey, all Range Officers and other range participants should continue to be reminded of the importance of practicing good personal hygiene when working at the RA Centre in order to reduce the potential transfer of lead from the firing range to "clean" areas (e.g. lunchroom, office areas, etc.) where the potential for inadvertent ingestion of lead would be higher. For example, transferring potentially contaminated items (e.g. used targets) from the firing range to lunchroom should be discouraged or done with caution (e.g. with proper cleaning).



2. The results of this survey are representative of the environmental and firearm activities of November 14, 15, 16, and 19, 2018. Exposure levels will vary with changing Firing Range conditions. For this reason, periodic air sampling should continue to be conducted to generate personal exposure histories, monitor the efficacy of control equipment and strategies, and evaluate inter-day and seasonal variations in exposure levels. With respect to the frequency of occupational hygiene surveys, there is no legislated requirement in Ontario. However, guidance is provided by the AIHA in their text “*A Strategy for Occupational Exposure Assessment*”. The AIHA reports, “every workplace must undergo periodic re-evaluation (annually, unless specified otherwise). Re-evaluation is also immediately triggered by employee complaint, process change, health surveillance concerns, new toxicology data, and new regulatory action”.
3. In accordance with the Occupational Health and Safety Act, the results of this report must be made available to staff and volunteers (such as posting in a conspicuous place) in the RA Centre facility and provided to the Joint Health and Safety Committee.

6.0 REFERENCES

1. *Occupational Health and Safety Act*, <http://www.ontario.ca/laws/statute/90o01>
2. *Designated Substances (O. Reg. 490/09)*, <http://www.ontario.ca/laws/regulation/090490>
3. NIOSH Manual of Analytical Methods, <http://www.cdc.gov/niosh/docs/2003-154/>

7.0 TERMS AND LIMITATIONS

This work was performed subject to the Terms and Limitations presented or referenced in the proposal for this project.

Information provided by Pinchin is intended for Client use only. Pinchin will not provide results or information to any party unless disclosure by Pinchin is required by law. Any use by a third party of reports or documents authored by Pinchin or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Pinchin accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted. No other warranties are implied or expressed.



8.0 CLOSURE

Pinchin would like to express our appreciation to the workers of The Recreation Association who were involved with or participated in this survey. If you require additional information on this report, or other matters, please do not hesitate to call.

222303.001 Lead Monitoring Hygiene Survey 2452 Riverside Dr Ottawa ON RA Centre

Template: Master Report for Provincial-Territory Occupational Hygiene Surveys, OH&S, October 22, 2018

APPENDIX A
Results of Air Monitoring



Table A1 – Results of Air Monitoring of Lead During ISSF Activity on November 14, 2018

Sample ID	Sample Description	Sample Duration (minutes)	Airborne Concentration (mg/m ³)	8-Hour Time-Weighted Average Exposure (mg/m ³)
S0001 (3016286)	Personal sample worn by volunteer Range Officer (Donald Clark) Approximately 7-8 shooters over the entire session.	18:45 – 20:52 (127)	0.0018	0.0009
S0002 (3016322)	Personal sample worn by volunteer participant (Benoit Deshaies) One of 7-8 shooters over the entire session.	18:56 – 20:46 (110)	0.0027	0.0014
S0003 (3016287)	Short-term personal sample worn by volunteer participant (Stephane Garnier) One of 8 shooters over the course of 1 relay.	19:45 – 20:00 (15)	0.0029	0.0015
S0004 (3016285)	Short-term personal sample worn by volunteer participant (Stephane Garnier) One of 8 shooters over the course of 1 relay.	20:00 – 20:15 (15)	0.0056	0.0028
S0005 (3016325)	Short-term personal sample worn by volunteer participant (Stephane Garnier) One of 8 shooters over the course of 1 relay.	20:15 – 20:30 (15)	0.016	0.0080
S0006 (3016311)	Blank Sample Taken for Quality Control	---	None Detected	
Exposure Limit:			0.05 mg/m ³ TWA	

Notes: The 8-hour Time-Weighted Average Exposures of the Range Officers and volunteer range participants were calculated assuming four hours of exposure (i.e. reported maximum duration of firing activities) at the measured concentrations and no further exposure to lead during an 8-hour period.

ISSF = International Sport Shooting Federation

TWA = 8-hour Time-Weighted Average limit.

mg/m³ = milligrams of airborne lead per cubic meter of air.

Firearms used during the ISSF activity were .22 or .38 calibre.



Table A2 – Results of Air Monitoring of Lead During IPSC Activity on November 15, 2018

Sample ID	Sample Description	Sample Duration (minutes)	Airborne Concentration (mg/m ³)	8-Hour Time-Weighted Average Exposure (mg/m ³)
S0007 (3016281)	Personal sample worn by volunteer Range Officer (Eugene Plaoude) One of 7-8 shooters over a continuous relay.	20:08 – 22:25 (137)	0.041	0.021
S0008 (3016283)	Personal sample worn by volunteer participant (Richard Paolini) One of 7-8 shooters over a continuous relay.	20:14 – 22:25 (131)	0.026	0.013
S0009 (3016326)	Short-term personal sample worn by volunteer participant (Paulo Viveiros) One of 7-8 shooters over a continuous relay.	20:12 – 21:25 (72)	0.016	0.0080
S0010 (3016284)	Short-term personal sample worn by volunteer participant (Sherry Rand) One of 7-8 shooters over a continuous relay.	21:30 – 22:20 (50)	0.043	0.022
S0011 (3016313)	Blank Sample Taken for Quality Control	---	None Detected	
Exposure Limit:			0.05 mg/m ³ TWA	

Notes: The 8-hour Time-Weighted Average Exposures of the Range Officers and volunteer range participants were calculated assuming four hours of exposure (i.e. reported maximum duration of firing activities) at the measured concentrations and no further exposure to lead during an 8-hour period.

IPSC = International Practice Shooting Confederation

TWA = 8-hour Time-Weighted Average limit.

mg/m³ = milligrams of airborne lead per cubic meter of air.

Firearms used during the IPSC activity were .357 or .45 calibre.



Table A3 – Results of Air Monitoring of Lead During Rifle Activity on November 16, 2018

Sample ID	Sample Description	Sample Duration (minutes)	Airborne Concentration (mg/m ³)	8-Hour Time-Weighted Average Exposure (mg/m ³)
S0012 (3016316)	Personal sample worn by volunteer Range Officers (Tomas Yeung and Steve Lyman). Approximately 8 shooters during 3 relays.	19:03 – 21:08 (125)	0.00057	0.00029
S0013 (3016320)	Personal sample worn by volunteer participant (Steve Smedmore). One of 8 shooters over 3 relays.	19:09 – 21:12 (123)	0.0050	0.0025
S0014 (3016289)	Short-term personal sample worn by volunteer participant (Trent Campbell). One of 8 shooters over one relay.	19:13 – 19:30 (17)	None Detected (less than 0.0014)	None Detected (less than 0.00070)
S0015 (3016321)	Short-term personal sample worn by volunteer participant (John Switzer). One of 8 shooters over one relay.	19:35 – 20:05 (30)	None Detected (less than 0.00082)	None Detected (less than 0.00041)
S0016 (3016321)	Short-term personal sample worn by volunteer participant (Jamie Dawkins). One of 8 shooters over one relay.	20:12 – 20:37 (25)	0.0049	0.0025
S0017 (3016315)	Blank Sample Taken for Quality Control	---	None Detected	None Detected
Exposure Limit:			0.05 mg/m ³ TWA	

Notes: The 8-hour Time-Weighted Average Exposures of the Range Officers and volunteer range participants were calculated assuming four hours of exposure (i.e. reported maximum duration of firing activities) at the measured concentrations and no further exposure to lead during an 8-hour period.

TWA = 8-hour Time-Weighted Average limit.

mg/m³ = milligrams of airborne lead per cubic meter of air.

Firearms used during the Rifle activity were .22 calibre.



Table A4 – Results of Air Monitoring of Lead During Handgun Activity on November 19, 2018

Sample ID	Sample Description	Sample Duration (minutes)	Airborne Concentration (mg/m ³)	8-Hour Time-Weighted Average Exposure (mg/m ³)
S0018 (3016288)	Personal sample worn by volunteer Range Officer (John Caskey). Approximately 8 shooters during approximately 6 relays.	18:56 – 21:07 (131)	0.0040	0.0020
S0019 (3016282)	Personal sample worn by volunteer participants (James O'Hara and Richard Tokarczyk). One of 8 shooters over approximately 8 relays.	19:02 – 21:22 (140)	0.0078	0.0039
S0020 (3016312)	Short-term personal sample worn by volunteer participant (Mike Thompson). One of approximately 8 shooters over one relay.	19:15 – 19:31 (16)	0.011	0.0055
S0021 (3016314)	Short-term personal sample worn by volunteer participant (Bruce Foster). One of approximately 8 shooters over one relay.	19:49 – 20:02 (13)	0.020	0.010
S0022 (3016324)	Short-term personal sample worn by volunteer participant (Ivan Fedorets). One of approximately 8 shooter over one relay.	20:54 – 21:15 (21)	0.0052	0.0026
S0023 (3016308)	Blank Sample Taken for Quality Control	---	None Detected	None Detected
Exposure Limit:			0.05 mg/m ³ TWA	

Notes: The 8-hour Time-Weighted Average Exposures of the Range Officers and volunteer range participants were calculated assuming four hours of exposure (i.e. reported maximum duration of firing activities) at the measured concentrations and no further exposure to lead during an 8-hour period.

TWA = 8-hour Time-Weighted Average limit.

mg/m³ = milligrams of lead per cubic meter of air.

Firearms used during the Handgun activity were .22 or 9mm calibre.

APPENDIX B
Maxxam Analytical Laboratory Report

Attention: Neil Box

PINCHIN, LTD.
1 Hines Road
Suite 200
Kanata, ON
Canada K2K 3C7

Report Date: 12/07/2018
Report #: R5515964
Version: 1 - Final

ANALYTICAL REPORT

MAXXAM JOB #: B8V5761
Received: 11/26/2018, 00:00

Sample Matrix: Air
Samples Received: 23

Analyses	Quantity	Date Analyzed	Laboratory Method	Reference
Metals, N7303/ASTM D7439-14 (ICP-MS)-Air	23	12/05/2018	Prep and Analysis of Filters N7303-MS	ASTM D7439-14/N7303

This report shall not be reproduced except in full, without the written approval of the laboratory.
Results relate only to the items tested.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Encryption Key

Please direct all questions regarding this Analytical Report to your Project Manager.
Wendy Lesniak, CS
Email: WLesniak@maxxamlabs.com
Phone# (248) 344-1770

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports.

ANALYTICAL RESULTS

Client ID: S0001 (3016286)		Matrix: Air			
Maxxam ID: IJV610		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/14/2018		Air Volume (L): 256.03			
	Mass	Concentration	RL		Date
ANALYTE	ug	mg/m3	ug	Test Method	Analyzed
Lead (Pb)	0.47	0.0018	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0002 (3016322)		Matrix: Air			
Maxxam ID: IJV611		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/14/2018		Air Volume (L): 451.33			
	Mass	Concentration	RL		Date
ANALYTE	ug	mg/m3	ug	Test Method	Analyzed
Lead (Pb)	1.2	0.0027	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0003 (3016287)		Matrix: Air			
Maxxam ID: IJV612		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/14/2018		Air Volume (L): 60.75			
	Mass	Concentration	RL		Date
ANALYTE	ug	mg/m3	ug	Test Method	Analyzed
Lead (Pb)	0.17	0.0029	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0004 (3016285)		Matrix: Air			
Maxxam ID: IJV613		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/14/2018		Air Volume (L): 56.7			
	Mass	Concentration	RL		Date
ANALYTE	ug	mg/m3	ug	Test Method	Analyzed
Lead (Pb)	0.32	0.0056	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0005 (3016325)		Matrix: Air			
Maxxam ID: IJV614		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/14/2018		Air Volume (L): 56.7			
	Mass	Concentration	RL		Date
ANALYTE	ug	mg/m3	ug	Test Method	Analyzed
Lead (Pb)	0.90	0.016	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

ANALYTICAL RESULTS

Client ID: S0006 (3016311)		Matrix: Air			
Maxxam ID: IJV615		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/14/2018					
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	<0.050	N/A	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0007 (3016281)		Matrix: Air			
Maxxam ID: IJV616		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/15/2018		Air Volume (L): 279.48			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	11	0.041	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0008 (3016283)		Matrix: Air			
Maxxam ID: IJV617		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/15/2018		Air Volume (L): 262			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	6.9	0.026	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0009 (3016326)		Matrix: Air			
Maxxam ID: IJV618		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/15/2018		Air Volume (L): 147.6			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	2.4	0.016	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0010 (3016284)		Matrix: Air			
Maxxam ID: IJV619		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/15/2018		Air Volume (L): 101.4			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	4.4	0.043	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

ANALYTICAL RESULTS

Client ID: S0011 (3016313)		Matrix: Air			
Maxxam ID: IJV620		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/15/2018					
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	<0.050	N/A	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0012 (3016316)		Matrix: Air			
Maxxam ID: IJV621		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/16/2018		Air Volume (L): 254.25			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	0.14	0.00057	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0013 (3016320)		Matrix: Air			
Maxxam ID: IJV622		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/16/2018		Air Volume (L): 247.5			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	1.2	0.0050	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0014 (3016289)		Matrix: Air			
Maxxam ID: IJV623		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/16/2018		Air Volume (L): 34.5			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	<0.050	<0.0014	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0015 (3016321)		Matrix: Air			
Maxxam ID: IJV624		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/16/2018		Air Volume (L): 61.02			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	<0.050	<0.00082	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

ANALYTICAL RESULTS

Client ID: S0016 (3016318)		Matrix: Air			
Maxxam ID: IJV625		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/16/2018		Air Volume (L): 50.83			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	0.25	0.0049	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0017 (3016315)		Matrix: Air			
Maxxam ID: IJV626		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/16/2018					
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	<0.050	N/A	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0018 (3016288)		Matrix: Air			
Maxxam ID: IJV627		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/19/2018		Air Volume (L): 265.93			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	1.1	0.0040	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0019 (3016282)		Matrix: Air			
Maxxam ID: IJV628		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/19/2018		Air Volume (L): 280			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	2.2	0.0078	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0020 (3016312)		Matrix: Air			
Maxxam ID: IJV629		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/19/2018		Air Volume (L): 32.18			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	0.37	0.011	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

ANALYTICAL RESULTS

Client ID: S0021 (3016314)		Matrix: Air			
Maxxam ID: IJV630		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/19/2018		Air Volume (L): 26.57			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	0.53	0.020	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0022 (3016324)		Matrix: Air			
Maxxam ID: IJV631		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/19/2018		Air Volume (L): 42.36			
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	0.22	0.0052	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

Client ID: S0023 (3016308)		Matrix: Air			
Maxxam ID: IJV632		Sample Media: MCE (0.8) untared, 37mm			
Date Sampled: 11/19/2018					
ANALYTE	Mass ug	Concentration mg/m3	RL ug	Test Method	Date Analyzed
Lead (Pb)	<0.050	N/A	0.050	ASTM D7439-14/N7303	12/05/2018
RL = Reporting Limit					

GENERAL COMMENTS

Unless otherwise noted below the following statements apply: 1) all samples were received in acceptable condition, 2) all quality control results associated with this sample set were within acceptable limits and /or do not adversely affect the reported results and 3) the industrial hygiene results have not been blank corrected.

Results relate only to the items tested.

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Maxxam Analytics

RUSH ANALYSIS

For Maxxam Analytics Use Only
Maxxam Analytics Lab Project No.

B8V5761



Detroit Lab
22345 Roethel Drive
Novi, MI 48375
(800) 806-5887
(248) 344-2652
FAX (248) 344-2655

Atlanta Lab
3380 Chastain Meadows Pky., Suite 300
Kennesaw, GA 30144
(800) 252-9919
(770) 499-7500
FAX (770) 499-7511

Chicago Lab
95 Oakwood Road
Lake Zurich, IL 60047
(888) 576-7522
(847) 726-3320
FAX (847) 726-3323

CONTACT LAB IN ADVANCE

Need Results by: 3 1 12 1 18

RUSH Charges Authorized? Yes No

(If yes, Initial here)

Email Results to NBox@Pinlon.com

REPORT RESULTS TO	Name <u>Nail Box</u>	Client Job No. <u>222763 001</u>	BILLING / INVOICE INFORMATION	<input type="checkbox"/> PO #	<input type="checkbox"/> Call for Credit Card Information	<input checked="" type="checkbox"/> Direct Bill
	Company <u>Pinlon</u>	Dept.		Name		
	Mailing Address <u>1 Alvin Road</u>			Company		
	City, State, Zip <u>Kanata FL 329</u>			Address		
	Telephone No. <u>612 592 3357</u>	FAX No.		City, State, Zip		

Special instructions and/or specific regulatory requirements:
(method, limit of detection, etc.)

ANALYSIS REQUESTED
(Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MINUTES SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)	FOR LAB USE ONLY											
- S0001 (3016286)	<u>Nov 14/18</u>		<u>Air</u>	<u>256.03L</u>	Lead (ICAMS)											
- S0002 (3016322)				<u>451.33</u>												
- S0003 (3016287)				<u>60.75</u>												
- S0004 (3016285)				<u>56.70</u>												
- S0005 (3016325)				<u>56.70</u>												
- S0006 (3016311)				<u>0</u>												
- S0007 (3016281)	<u>Nov 15/18</u>			<u>279.48</u>												
- S0008 (3016283)				<u>262</u>												
- S0009 (3016326)				<u>147.6</u>												
- S0010 (3016284)				<u>101.4</u>												
- S0011 (3016313)				<u>0</u>												
- S0012 (3016316)	<u>Nov 16/18</u>			<u>254.25</u>												

CHAIN OF CUSTODY	Collected by: <u>Nail Box</u> (print)	Collector's Signature: _____		
	Relinquished by: <u>[Signature]</u>	Date/Time: <u>Nov 15/18</u>	Received by: _____	Date/Time: _____
	Relinquished by: _____	Date/Time: _____	Received by: _____	Date/Time: _____
	Method of Shipment: <u>Carrier</u>	Received at Lab by: <u>[Signature]</u>	Date/Time: <u>11/20/18 310</u>	
Authorized by: <u>[Signature]</u>	Date: _____	Sample Condition Upon Receipt: <input checked="" type="checkbox"/> Acceptable <input type="checkbox"/> Other (explain)		

(Client Signature MUST Accompany Request)

REQUEST FOR LABORATORY ANALYTICAL SERVICES

Maxxam Analytics

RUSH ANALYSIS
CONTACT LAB IN ADVANCE
 Need Results by: 3 / 12 / 18
 RUSH Charges Authorized? Yes No
 (If yes, Initial here) MM
 Email Results to uBox@pinclin.com

For Maxxam Analytics Use Only
 Maxxam Analytics Lab Project No.



Detroit Lab
 22345 Roethel Drive
 Novi, MI 48375
 (800) 806-5887
 (248) 344-2652
 FAX (248) 344-2655

Atlanta Lab
 3380 Chastain Meadows Pky., Suite 300
 Kennesaw, GA 30144
 (800) 252-9919
 (770) 499-7500
 FAX (770) 499-7511

Chicago Lab
 95 Oakwood Road
 Lake Zurich, IL 60047
 (888) 576-7522
 (847) 726-3320
 FAX (847) 726-3323

REPORT RESULTS TO	Name <u>Neil Bon</u>	Client Job No. <u>222 303 001</u>	BILLING / INVOICE INFORMATION	<input type="checkbox"/> PO # _____	<input type="checkbox"/> Call for Credit Card Information	<input checked="" type="checkbox"/> Direct Bill
	Company <u>Pinclin</u>	Dept. _____		Name _____		
	Mailing Address <u>1 Mines Road</u>			Company _____		
	City, State, Zip <u>Kenota 4214 307</u>			Address _____		
	Telephone No. <u>613 542 3387</u>	FAX No. _____		City, State, Zip _____		

Special instructions and/or specific regulatory requirements:
 (method, limit of detection, etc.)

ANALYSIS REQUESTED
 (Enter an 'X' in the box below to indicate request. Enter a 'P' if Preservative added.)

CLIENT SAMPLE IDENTIFICATION	DATE SAMPLED	MINUTES SAMPLED	MATRIX/MEDIA	AIR VOLUME (specify units)	FOR LAB USE ONLY																	
Sec 13 (3016320)	Nov 16/18			247.50 L																		
Sec 14 (3016289)				39.5																		
Sec 15 (3016321)				61.02																		
Sec 16 (3016318)				50.83																		
Sec 17 (3016315)				0																		
Sec 18 (3016288)	Nov 14/18			265.43																		
Sec 19 (3016282)				280																		
Sec 20 (3016312)				32.18																		
Sec 21 (3016314)				26.57																		
Sec 22 (3016324)				42.36																		
Sec 23 (3016308)				0																		

CHAIN OF CUSTODY	Collected by: <u>Neil Bon</u> (print)	Collector's Signature: _____		
	Relinquished by: <u>[Signature]</u>	Date/Time <u>Nov 23/18</u>	Received by: _____	Date/Time _____
	Relinquished by: _____	Date/Time _____	Received by: _____	Date/Time _____
	Method of Shipment: <u>Comms</u>	Received at Lab by: <u>[Signature]</u>	Date/Time <u>11/26/18</u>	

Sample Condition Upon Receipt: Acceptable Other (explain)

Authorized by: _____ Date _____