REVISED

Asbestos Reassessment

CCGS Limnos
Vessel Number 328088
370 Dalhousie Street,
Amherstburg, Ontario

Prepared for:

Canadian Coast Guard
520 Exmouth Street
Sarnia, Ontario, N7T 8B1

Attention: Leslie Anne Veldman
Project Officer, Marine Engineering, Central and Artic

July 16, 2019

Pinchin File: 241027

Issued to:	**Canadian Coast Guard**
Contact:	**Leslie Anne Veldman**
	Project Officer, Marine Engineering, Central and Artic
Issued on:	**July 16, 2019**
Pinchin File:	**241027**
Issuing Office:	**Tilbury, ON**
Pinchin Contact:	**Graham Rogers**
	519.682.4492 ext. 3302
	grogers@pinchin.com

Author: Dylan Melo, B.Sc.
Project Technologist
519.682.4492 ext. 3307
dmelo@pinchin.com

Reviewer: Tina Manning, CRSP, PMP, LEED AP
Operations Manager
519.682.4492 ext. 3301
tmanning@pinchin.com

EXECUTIVE SUMMARY

Canadian Coast Guard (Client) retained Pinchin Ltd. (Pinchin) to conduct an asbestos building materials reassessment in the CCGS Limnos docked at 370 Dalhousie Street, Amherstburg, Ontario. The reassessment was performed on May 13, 2019. Pinchin collected additional samples on July 2, 2019 when the vessel was docked at Hamilton Harbour, 47 Discovery Drive, Hamilton, Ontario.

The objective of the reassessment was to evaluate the condition and quantity of previously reported asbestos-containing materials (ACM), and develop corrective action plans as required for the purposes of long term management. The results of this assessment are not intended for construction, renovation, demolition or project tendering purposes.

The assessed area consisted of the entire vessel, excluding the exterior finishes, as shown on the drawings in Appendix I.

SUMMARY OF FINDINGS

Asbestos-containing materials (ACM) are present as follows:

- 9”x9” beige vinyl floor tiles with a brown fleck pattern in the Corridor and Boot Room Old Incinerator Room (Locations 3 and 31), observed in good condition.
- Transite cement paneling behind the electrical panel in the Wheelhouse (Location 1).

SUMMARY OF RECOMMENDATIONS

The following is a summary of significant recommendations; refer to the body of the report for detailed recommendations.

1. Prepare an Asbestos Management program (AMP).
2. Perform a reassessment of asbestos materials on an annual basis.
3. Prior to renovations or demolition, perform a pre-construction assessment to identify any hazardous materials that may be disturbed by the work.
4. Follow appropriate safe work procedures when handling or disturbing asbestos.

This Executive Summary is subject to the same standard limitations as contained in the report and must be read in conjunction with the entire report.

TABLE OF CONTENTS

1.0 INTRODUCTION AND SCOPE 1
1.1 Scope of Assessment 1
2.0 BACKGROUND INFORMATION 1
2.1 Vessel Description 1
2.2 Existing Reports and Summary of Asbestos Abatement 2
3.0 FINDINGS 3
3.1 Spray-Applied Insulation 3
3.2 Texture Finishes (Decorative) 3
3.3 Pipe Insulation 3
3.4 Duct Insulation and Mastic 4
3.5 Mechanical Equipment Insulation 4
3.6 Vermiculite 5
3.7 Acoustic Ceiling Tiles 5
3.8 Plaster 5
3.9 Drywall Joint Compound 5
3.10 Asbestos Cement Products (Transite) 5
3.11 Vinyl Sheet Flooring 6
3.12 Vinyl Floor Tile and Mastic 6
3.13 Firestopping 7
3.14 Levelling Compound 7
3.15 Sealants, Caulking, and Putty 7
3.16 Paper and Textile Products 8
3.17 Other Building Materials 8
3.18 Presumed Asbestos Materials 9
4.0 RECOMMENDATIONS 10
4.1 General 10
4.2 On-going Management and Maintenance 10
5.0 TERMS AND LIMITATIONS 10
6.0 REFERENCES 10

APPENDICES

APPENDIX I Drawings
APPENDIX II Asbestos Analytical Certificates
APPENDIX III Methodology
APPENDIX IV Additional Photographs
APPENDIX V Location Summary Report
APPENDIX VI Asbestos Material Summary Report
APPENDIX VII All Data Report
APPENDIX VIII TEM Air Sample Lab Analysis Report

1.0 INTRODUCTION AND SCOPE

Canadian Coast Guard (Client) retained Pinchin Ltd. (Pinchin) to conduct an asbestos building materials reassessment in the CCGS Limnos docked at 370 Dalhousie Street, Amherstburg, Ontario. Pinchin collected additional samples on July 2, 2019 when the vessel was docked at Hamilton Harbour, 47 Discovery Drive, Hamilton, Ontario.

The reassessment was performed by Dylan Melo, B.Sc., Project Technologist on May 13, 2019 and the additional sample collection was completed by Stephen Holmquist on July 2, 2019. The surveyor was accompanied by Leslie Veldman during the assessment. The vessel was occupied at the time of the assessment.

The objectives of the reassessment were to document the locations, quantities and conditions of previously identified asbestos containing building materials, and develop corrective action plans as required. This reassessment is only to be used for the purposes of long term management and routine maintenance. The results of this reassessment are not to be used for construction, renovation, demolition or project tendering purposes.

1.1 Scope of Assessment

The objective of the reassessment was to evaluate the condition and quantity of previously reported asbestos-containing materials (ACM), and develop corrective action plans as required.

Additional objectives included the following:

- Document any asbestos abatement that was performed since the last assessment.
- Collect additional samples as necessary to comply with provincial sampling requirements
- Collect three occupied air samples (and one field blank) for Phase Contrast Microscopy (PCM) and Transmission Electron Microscopy (TEM) analysis. Locations of air samples were indicated by the Client; and shown on the attached drawing.

Please refer to Appendix III for a detailed description of the methodology used for this assessment.

Please refer to Appendix VIII for the TEM air sample lab analysis report.

2.0 BACKGROUND INFORMATION

2.1 Vessel Description

Description Item	Details
Use	Coast Guard vessel

Description Item	Details
Number of Floors	The vessel is 3 stories plus 1 levels below.
Total Area	The total assessed area is approximately 5000 square feet.
Year of Construction	The vessel was constructed in 1968.
Structure	Metal
Exterior Cladding	Metal
HVAC	N/A
Roof	N/A
Flooring	Vinyl floor tiles, vinyl sheet flooring, ceramic tile, metal, concrete, and terrazzo
Interior Walls	Metal, plastic, fibrous board, and wood
Ceilings	Metal, plastic, lay-in ceiling tiles, and wood

2.2 Existing Reports and Summary of Asbestos Abatement

2.2.1 Review of Previous Reports

Pinchin was provided with the following reports, which have been reviewed as part of this reassessment:

- *"Asbestos Materials Report Canadian Coast Guard Ship Limnos",* prepared March 21, 2005, Pinchin project number 28432.
- *"Asbestos Materials Survey Report for Canadian Coast Guard Services, Vessel Name: CCGS Limnos, Vessel NO:328088",* prepared April 19, 2006, Pinchin project number 01-6116.
- *"Letter of Findings from Investigation in Mechanical Room on a Canadian Coast Guard Limnos Ship",* August 11, 2006, Pinchin project number 36403.

2.2.2 Summary of Asbestos Abatement since the Previous Assessment

Abatement work has been completed since the last assessment. Based on observations made during the reassessment, the following abatement work has been conducted, since completion of the previous report:

- Approximately 500 square feet of the 9"x9" beige vinyl floor tiles with a white stripes pattern (previous sample 0001, lab report reference 2556478-2556450), from Locations 1, 2, 26, 29.

- Approximately five parging cement pipe fittings from the Utility Locker (Location 16).
- Door with mag-block insulation (samples 0005A-C, lab report reference 2556490-2556492) from the Showers and Washroom (Location 20).
- A fire door, containing amosite asbestos core, was reported as being removed in previous 2005 report.

3.0 FINDINGS

The following section summarizes the findings of the reassessment and provides a general description of the asbestos materials identified and their locations.

For details on quantities, condition and locations of ACM; refer to the Asbestos Material Summary Report and All Data Report in Appendix VI and VII.

Refer to the drawing in Appendix I for the locations of all known ACMs indicated via hatching or symbols. The locations of samples from both the current assessment, and historical assessments performed by Pinchin, have beed included on the drawings.

Appendix II presents the asbestos bulk sample analytical results.

3.1 Spray-Applied Insulation

Spray applied insulation was not observed during the assessment.

3.2 Texture Finishes (Decorative)

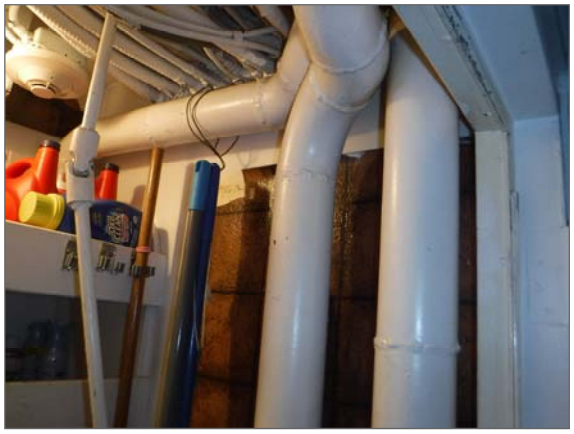
No texture finishes were observed during the assessment.

3.3 Pipe Insulation

Parging cement, containing chrysotile asbestos (sample 0004A-C, lab report reference 2556487-2556489), was previously noted on the fittings (elbows, tees, valves, hangers, etc.) in the Utility Locker and Dry Storage Area (Location 16). Parging cement was not observed during this assessment.

All observed piping was either uninsulated, or are insulated with fibreglass, or other non-asbestos insulation such as mineral fibre or elastomeric foam insulation (Armaflex).

Pipes insulated with friable asbestos insulations may be present in inaccessible spaces such as above solid ceilings, in chases, in column enclosures and within shafts.



Uninsulated piping Utility and Dry storage Area (Location 16)

3.4 Duct Insulation and Mastic

All observed ducting was either uninsulated or insulated with non-asbestos fibreglass (foil-faced or canvas) and Armaflex.

The white lagging compound covering the canvas and fiberglass on ductwork in the Engine Room (Location 29) was sampled and does not contain asbestos (sample S0016A-C, lab reference 71912988).

The client identified yellow suspect insulation covering the fibreglass on ductwork in the Engine Room (Location 29) was sampled and does not contain asbestos (sample S0017A-C, lab reference 71912988)

Client identified lagging compound and suspect insulation.

3.5 Mechanical Equipment Insulation

Mechanical equipment is either uninsulated or insulated with non-asbestos fibreglass.

3.6 Vermiculite

Loose fill vermiculite debris was not observed in the spaces or areas inspected. Destructive testing was not performed and vermiculite may be present within masonry block walls, above solid ceilings or other void spaces.

3.7 Acoustic Ceiling Tiles

Acoustic ceiling tile are present in the assessed area, as follows:

Size, Type, Pattern	Location Name (Location #); Quantity	Sample Number or Date Code	Asbestos Type
24”x48”, white fissured	Engine Room (Location 29)	0006-C, lab report reference 2556493-2556495	None Detected
24”x48”, white with small pinholes	Corridor (Location 17)	S0018A-C, lab reference 71912988	None Detected

3.8 Plaster

Plaster was not observed in the assessed area.

3.9 Drywall Joint Compound

Drywall and joint compound was not observed during the assessment.

3.10 Asbestos Cement Products (Transite)

Transite cement board, containing chrysotile asbestos (samples S0021A-C, lab reference 71912988), is present behind the electrical panel in the Wheel House (Location 1). Transite is a non-friable material and was observed in good condition.

Asbestos-containing transite

3.11 Vinyl Sheet Flooring

Vinyl sheet flooring is present in the vessel as follows:

Pattern, Colour	Location Name (Location #); Quantity	Sample Number	Asbestos Type
Grey with grey and white smear pattern	Scientists and Officer Mess (Location 19)	S0010 A-C, lab reference 71912988	None Detected
Faux brick pattern	Utility Locker and Dry Storage (Location 16)	S0009 A-C, lab reference 71912988	None Detected
Orange	Crew's Mess (Location 21)	Client installed in last 10 years	N/A

3.12 Vinyl Floor Tile and Mastic

Vinyl floor tiles are present as follows:

Size, Pattern, Colour	Location Name (Location #); Quantity	Sample Number	Asbestos Type (tile)	Asbestos Type (mastic)
9"x9" beige with brown speck	Corridor (Location 3) – 200SF Boot Room Old Incinerator Room (Location 31) – 10 SF	0003A-C; lab report reference 25566484-25564686).	**Chrysotile**	None Detected
12"x12" off-white with brown streak	Focle Deck (Location 32)	S0011 A-C, lab reference 71912988	None Detected	None Detected

The asbestos-containing vinyl floor tiles are a non-friable material and were observed in good condition.

Asbestos-containing 9”x9” beige vinyl floor tiles; depicting painted and not painted conditions.

3.13 Firestopping

The red firestopping sealant covering the pipe and conduit penetrations throughout the vessel was sampled and does not contain asbestos (samples S0013A-C; lab report reference 71912988).

Non-asbestos red fire stopping

3.14 Levelling Compound

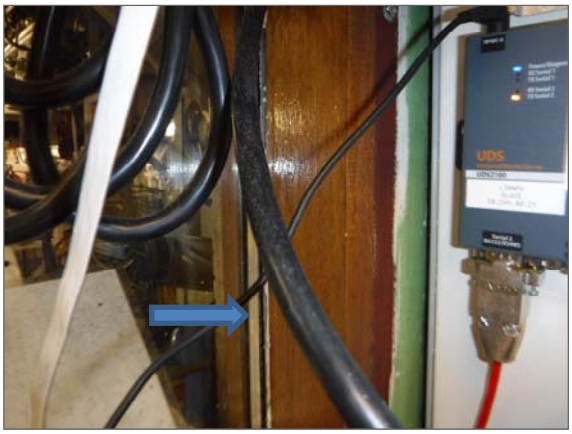
Levelling compound is often used in random and isolated areas and without removing all flooring may not always be detected.

3.15 Sealants, Caulking, and Putty

The following table presents a summary of caulking, sealants and putties present:

Material and Colour	Location (Location #)	Quantity	Sample Number	Asbestos Type
Caulking, brown	Window frames in the Lab (Location 6)	80 LF	S0014A-C, lab report reference 71912988	None Detected
Caulking, white	Window frames in the Engine Room (Location 29)	80 LF	S0015A-C, lab report reference 71912988	None Detected

Non-asbestos brown window caulking.



Non-asbestos white window caulking.

3.16 Paper and Textile Products

Fibrous board (millboard), containing amosite and chrysotile asbestos (previous samples 0007A-C; lab report reference 2556496-2556498), previously noted in the Engine Room (Location29) was abated and no longer exists in in the vessel. New plastic wall panelling was observed in the Engine Room (Location 29).

The laminate fibreboard present on the walls in the Diesel Generator Room (Location 30) and in the Lamp Locker (Locations 33) was sampled and does not contain asbestos (sample S022A-C, lab report reference B213116).

3.17 Other Building Materials

The black antisweat mastic present on the underside of the sink in the Lab (Location 6) was sampled and does not contain asbestos (samples S0008A-C, lab report reference 71912988).

The core insulation present inside both the A and B fire doors throughout the vessel was sampled and does not contain asbestos (samples S0019A-C, lab report reference 71912988).

Both the 1/2” and 1/8” cable insulation present throughout the vessel was sampled and do not contain asbestos (samples S0012A-C and S0020A-C, lab report reference 71912988).

The white mineral fibre insulation present on the structure of the vessel was previously sampled and does not contain asbestos (samples 0002A-C, lab report reference 25566481-2556883).

Non-asbestos black sink mastic.

3.18 Presumed Asbestos Materials

The methodology identifies a list of materials which may contain asbestos, which were not to be sampled, based on limitations of the scope. The following is a list of materials which may contain asbestos, which were not observed during the assessment, but based on site conditions may be present. If discovered, these materials are presumed to contain asbestos until otherwise proven by sampling and analysis:

- Floor levelling compound
- Ceramic tile setting compound
- Electrical components
- Refractory materials and insulations in boilers, incinerators and stacks
- Insulation under metal clad boilers and vessels
- Mechanical packing, ropes and gaskets
- Vermiculite in wall and ceiling cavities
- Fibre-reinforced paints and coatings
- Metal clad finishes
- Materials outside the assessed area

4.0 RECOMMENDATIONS

4.1 General

Perform a detailed intrusive assessment prior to building renovation or demolition operations. The assessment should include; destructive testing (i.e. coring and/or removal of building finishes and components), sampling of other hazardous materials (lead, mercury, PCBs, mould, etc.), and materials not tested in this study (i.e. roofing materials, caulking, mastics).

4.2 On-going Management and Maintenance

The following recommendations are made regarding on-going management and maintenance work involving the asbestos materials identified:

- Prepare an Asbestos Management program (AMP). The AMP should address and document; written work practices, worker training requirements, notifications, policies and responsibilities.
- Perform a reassessment of asbestos materials on an annual basis.
- Remove asbestos-containing materials (ACM) prior to alteration or maintenance work if ACM may be disturbed by the work. Follow appropriate asbestos precautions for the classification of work being performed.
- Update the asbestos inventory report for the building upon completion of any abatement of ACM.

5.0 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.

6.0 REFERENCES

The following legislation and documents were referenced in completing the assessment and this report:

Federal

1. Canada Occupational Health and Safety Regulation, SOR/86-304.

Ontario

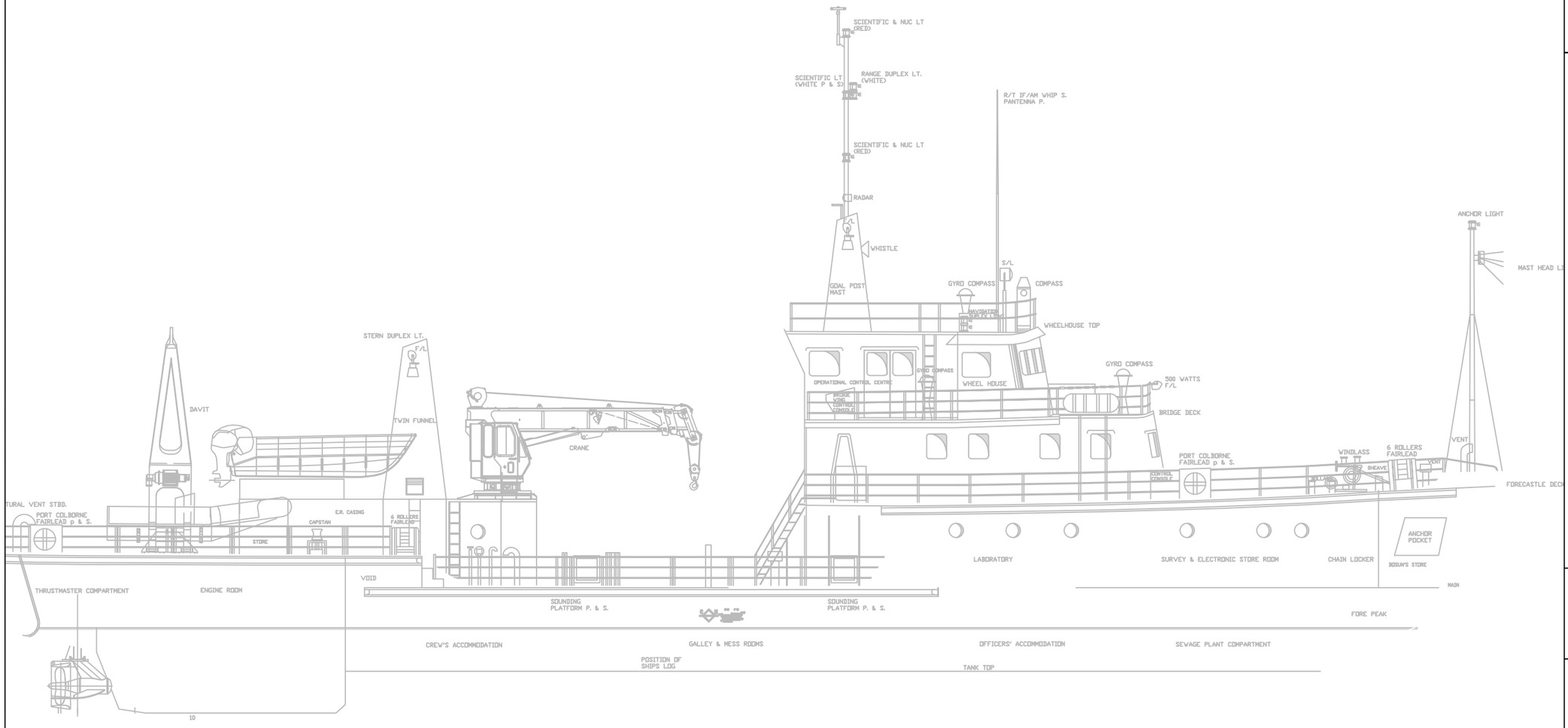
1. Asbestos on Construction Projects and in Buildings and Repair Operations, Ontario Regulation 278/05.
2. Designated Substances, Ontario Regulation 490/09.

J:\241000s\0241027.000 CanadianCoastGuard,CCGSLimnos,HAZ,REASST\Deliverables\241027 CGS Limno Vessel Asbestos Reassessment Report, June 2019.docx

Template: Master Report for Asbestos Reassessment, HAZ, April 23, 2019

APPENDIX I

Drawings



PINCHIN

LEGEND:

- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- PCM AIR SAMPLE LOCATION
- ACM VINYL FLOOR TILES
- ACM TRANSITE PANEL

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

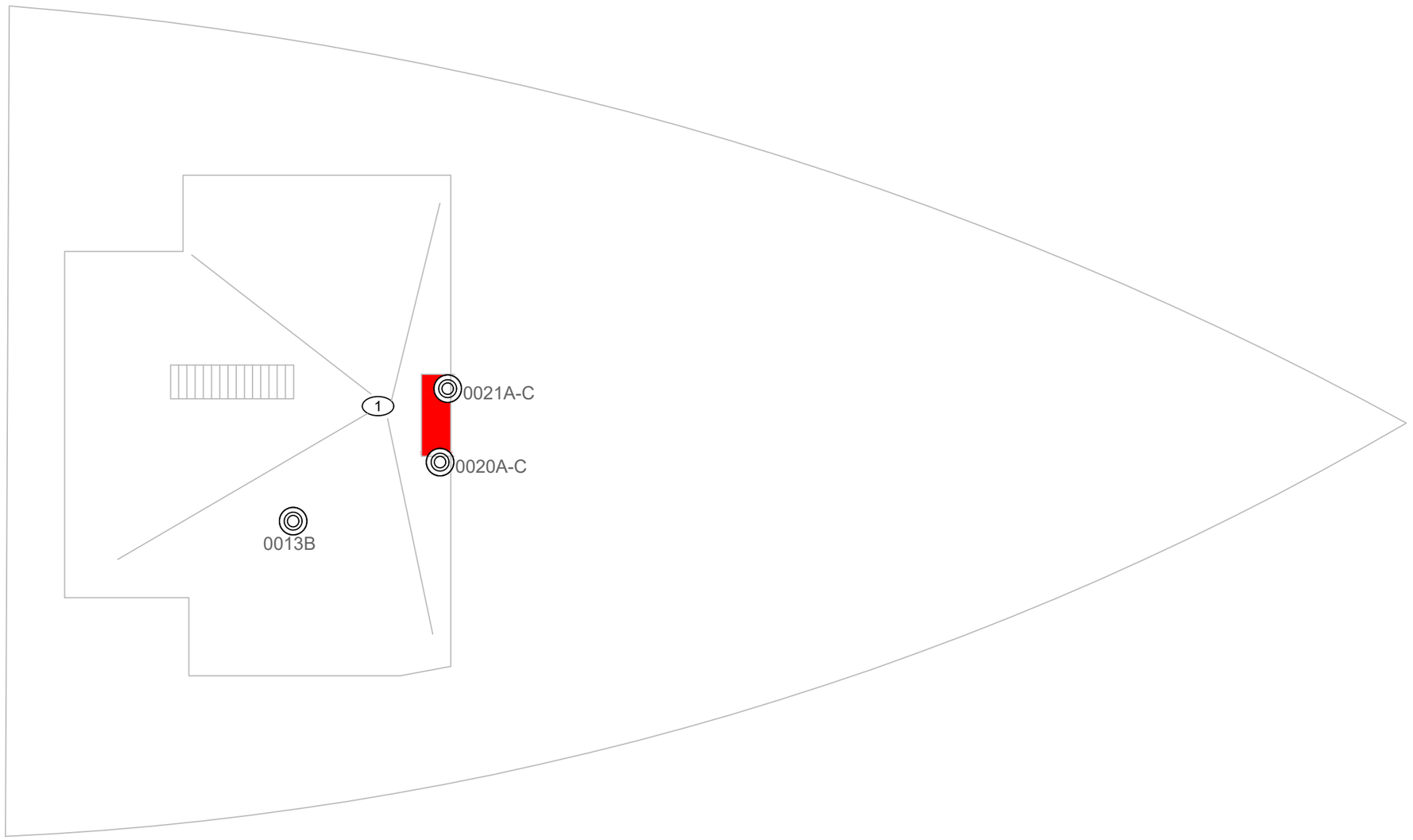
CLIENT:
CCGS
LIMNOS
VESSEL 328088

LOCATION:
370 DALHOUSIE ST.
AMHERSTBURG, ONTARIO

TITLE:
ASBESTOS REASSESSMENT

SHIP OVERVIEW

DATE:	PROJECT # :
2019/05/29	241027
DRAWN BY: DM	DRAWING:
CHECKED BY: TM	1 0F 5
SCALE: NTS	



PINCHIN

LEGEND:

- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- PCM AIR SAMPLE LOCATION
- ACM VINYL FLOOR TILES
- ACM TRANSITE PANEL

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

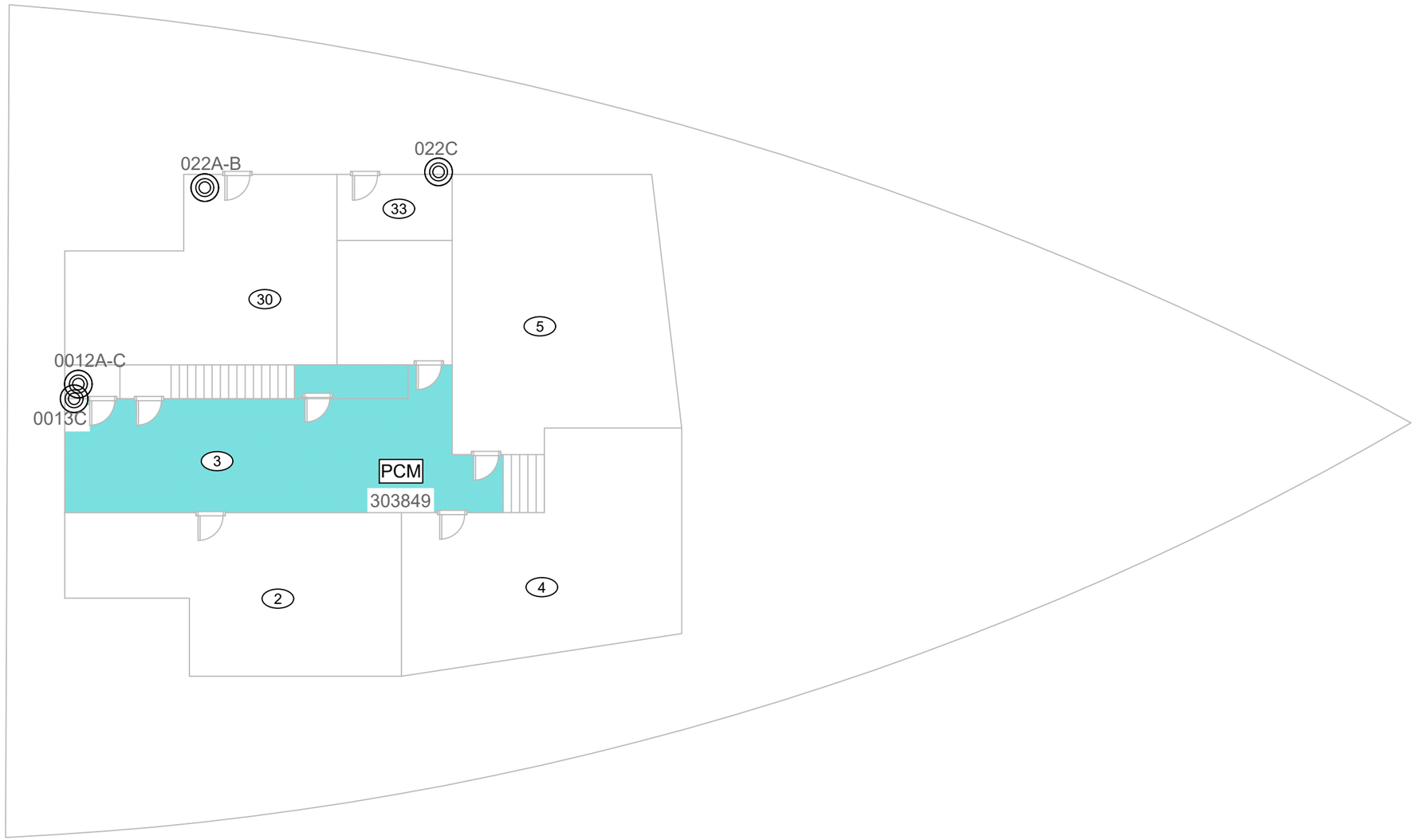
CLIENT:
CCGS
LIMNOS
VESSEL 328088

LOCATION:
370 DALHOUSIE ST.
AMHERSTBURG, ONTARIO

TITLE:
ASBESTOS REASSESSMENT

BRIDGE/ WHEELHOUSE

DATE:	PROJECT # :
2019/05/29	241027
DRAWN BY: DM	DRAWING:
CHECKED BY: TM	2 0F 5
SCALE: NTS	



PINCHIN

LEGEND:
- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- PCM AIR SAMPLE LOCATION
- ACM VINYL FLOOR TILES
- ACM TRANSITE PANEL

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

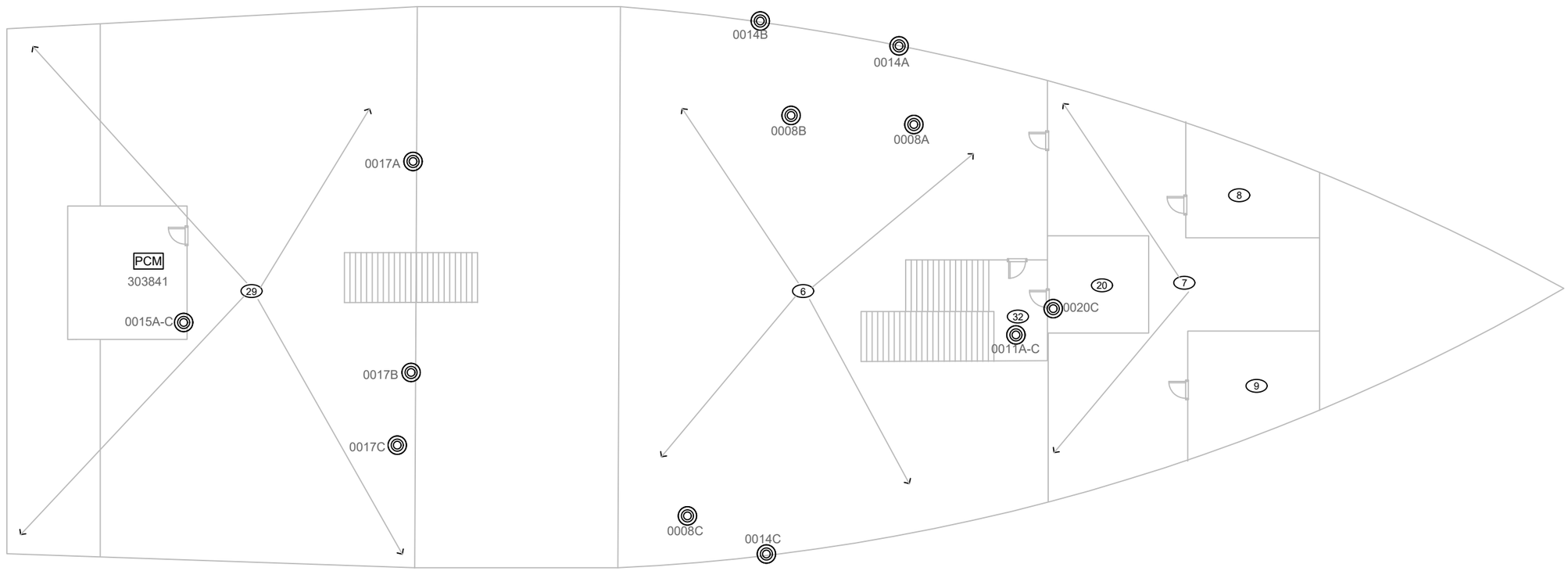
CLIENT:
CCGS
LIMNOS
VESSEL 328088

LOCATION:
370 DALHOUSIE ST.
AMHERSTBURG, ONTARIO

TITLE:
ASBESTOS REASSESSMENT

FORECASTLE DECK

DATE:	PROJECT # :
2019/05/29	241027
DRAWN BY: DM	DRAWING: 3 OF 5
CHECKED BY: TM	
SCALE: NTS	



PINCHIN

LEGEND:

- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- PCM AIR SAMPLE LOCATION
- ACM VINYL FLOOR TILES
- ACM TRANSITE PANEL

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

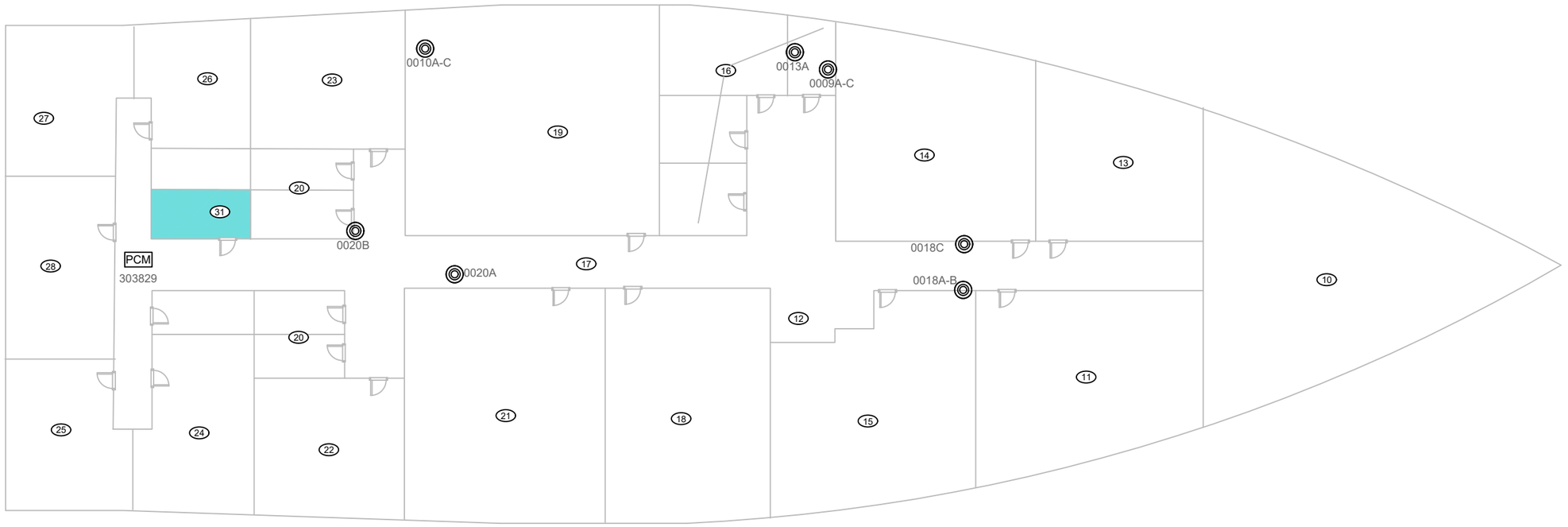
CLIENT:
CCGS
LIMNOS
VESSEL 328088

LOCATION:
370 DALHOUSIE ST.
AMHERSTBURG, ONTARIO

TITLE:
ASBESTOS REASSESSMENT

MAIN DECK

DATE:	PROJECT # :
2019/05/29	241027
DRAWN BY: DM	DRAWING: 4 OF 5
CHECKED BY: TM	
SCALE: NTS	



PINCHIN

LEGEND:

- (X) PINCHIN LOCATION NUMBER
- ASBESTOS BULK SAMPLE
- PCM AIR SAMPLE LOCATION
- ACM VINYL FLOOR TILES
- ACM TRANSITE PANEL

NOT ALL KNOWN OR SUSPECTED HAZARDOUS BUILDING MATERIALS MAY BE DEPICTED ON THE DRAWING. REFER TO THE HAZARDOUS BUILDING MATERIALS ASSESSMENT REPORT FOR A COMPLETE LIST OF KNOWN AND SUSPECTED HAZARDOUS BUILDING MATERIALS.

LEGEND IS COLOUR DEPENDENT. NON-COLOUR COPIES MAY ALTER INTERPRETATION.

BASE PLAN PROVIDED BY CLIENT.

CLIENT:
CCGS
LIMNOS
VESSEL 328088

LOCATION:
370 DALHOUSIE ST.
AMHERSTBURG, ONTARIO

TITLE:
ASBESTOS REASSESSMENT

LOWER DECK

DATE:	PROJECT # :
2019/05/29	241027
DRAWN BY: DM	DRAWING: 5 OF 5
CHECKED BY: TM	
SCALE: NTS	

APPENDIX II

Asbestos Analytical Certificates

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0008A *71912988PLM_1*	Mastic, Black,Loc:6,Lab	None Detected		100% Other	Black Non Fibrous Homogeneous Dissolved
S0008B *71912988PLM_2*	Mastic, Black,Loc:6,Lab	None Detected		100% Other	Black Non Fibrous Homogeneous Dissolved
S0008C *71912988PLM_3*	Mastic, Black,Loc:6,Lab	None Detected		100% Other	Black Non Fibrous Homogeneous Dissolved
S0009A - A *71912988PLM_4*	Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locke *vinyl sheet flooring*	None Detected	20% Cellulose 10% Wollastonite	70% Other	Brown Non Fibrous Homogeneous Ashed, Dissolved
S0009A - B *71912988PLM_43*	Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locke *mastic*	None Detected		100% Other	Yellow Non Fibrous Homogeneous Dissolved
S0009B - A *71912988PLM_5*	Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locke *vinyl sheet flooring*	None Detected	20% Cellulose 10% Wollastonite	70% Other	Brown Non Fibrous Homogeneous Ashed, Dissolved
S0009B - B *71912988PLM_44*	Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locke *mastic*	None Detected		100% Other	Yellow Non Fibrous Homogeneous Dissolved
S0009C - A *71912988PLM_6*	Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locke *vinyl sheet flooring*	None Detected	20% Cellulose 10% Wollastonite	70% Other	Brown Non Fibrous Homogeneous Ashed, Dissolved

Philip Szabo (51)

Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0009C - B *71912988PLM_45*	Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locke *mastic*	None Detected		100% Other	Yellow Non Fibrous Homogeneous Dissolved
S0010A - A *71912988PLM_7*	Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Offi *vinyl sheet flooring*	None Detected		100% Other	Gray Non Fibrous Homogeneous Ashed, Dissolved
S0010A - B *71912988PLM_46*	Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Offi *mastic*	None Detected		100% Other	Yellow Non Fibrous Homogeneous Dissolved
S0010B - A *71912988PLM_8*	Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Offi *vinyl sheet flooring*	None Detected		100% Other	Gray Non Fibrous Homogeneous Ashed, Dissolved
S0010B - B *71912988PLM_47*	Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Offi *mastic*	None Detected		100% Other	Yellow Non Fibrous Homogeneous Dissolved
S0010C - A *71912988PLM_9*	Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Offi *vinyl sheet flooring*	None Detected		100% Other	Gray Non Fibrous Homogeneous Ashed, Dissolved
S0010C - B *71912988PLM_48*	Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Offi *mastic*	None Detected		100% Other	Yellow Non Fibrous Homogeneous Dissolved
S0011A - A *71912988PLM_10*	Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32, *tile*	None Detected		100% Other	White Non Fibrous Homogeneous Dissolved

Philip Szabo (51)

Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0011A - B *71912988PLM_49*	Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32, *mastic*	**None Detected**		**100% Other**	Yellow Non Fibrous Homogeneous Dissolved
S0011B - A *71912988PLM_11*	Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32, *tile*	**None Detected**		**100% Other**	White Non Fibrous Homogeneous Dissolved
S0011B - B *71912988PLM_50*	Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32, *mastic*	**None Detected**		**100% Other**	Yellow Non Fibrous Homogeneous Dissolved
S0011C - A *71912988PLM_12*	Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32, *tile - ashed*	**None Detected**		**100% Other**	White Non Fibrous Homogeneous Ashed, Dissolved
S0011C - B *71912988PLM_51*	Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32, *mastic*	**None Detected**		**100% Other**	Yellow Non Fibrous Homogeneous Dissolved
S0012A *71912988PLM_13*	1/2" Cable,Loc:3,Corridor	**None Detected**	**10% Cellulose**	**90% Other**	Black Non Fibrous Homogeneous Dissolved
S0012B *71912988PLM_14*	1/2" Cable,Loc:3,Corridor	**None Detected**	**10% Cellulose**	**90% Other**	Black Non Fibrous Homogeneous Dissolved
S0012C *71912988PLM_15*	1/2" Cable,Loc:3,Corridor	**None Detected**	**10% Cellulose**	**90% Other**	Black Non Fibrous Homogeneous Dissolved

Philip Szabo (51)

Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0013A *71912988PLM_16*	Firestopping Red (mastic),Loc:16,Utility Locker And dry Storage	None Detected	5% Fiber Glass	95% Other	Red Non Fibrous Homogeneous Ashed, Dissolved
S0013B *71912988PLM_17*	Firestopping Red (mastic),Loc:1,Wheel House	None Detected	5% Fiber Glass	95% Other	Red Non Fibrous Homogeneous Ashed, Dissolved
S0013C *71912988PLM_18*	Firestopping Red (mastic),Loc:3,Corridor	None Detected	5% Fiber Glass	95% Other	Red Non Fibrous Homogeneous Ashed, Dissolved
S0014A *71912988PLM_19*	Brown Window Caulking,Loc:6,Lab	None Detected		100% Other	Brown Non Fibrous Homogeneous Ashed, Dissolved
S0014B *71912988PLM_20*	Brown Window Caulking,Loc:6,Lab	None Detected		100% Other	Brown Non Fibrous Homogeneous Ashed, Dissolved
S0014C *71912988PLM_21*	Brown Window Caulking,Loc:6,Lab	None Detected		100% Other	Brown Non Fibrous Homogeneous Ashed, Dissolved
S0015A *71912988PLM_22*	White Window Caulking,Loc:29,Engine Room	None Detected		100% Other	White Non Fibrous Homogeneous Ashed, Dissolved
S0015B *71912988PLM_23*	White Window Caulking,Loc:29,Engine Room	None Detected		100% Other	White Non Fibrous Homogeneous Ashed, Dissolved

Philip Szabo (51)

Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0015C *71912988PLM_24*	White Window Caulking,Loc:29,Engine Room	None Detected		100% Other	White Non Fibrous Homogeneous Ashed, Dissolved
S0016A *71912988PLM_25*	Lagging Compoud on Ductwork, Loc:29,Engine Room	None Detected	95% Fiber Glass	5% Other	White Fibrous Homogeneous Teased, Dissolved
S0016B *71912988PLM_26*	Lagging Compoud on Ductwork, Loc:29,Engine Room	None Detected	95% Fiber Glass	5% Other	White Fibrous Homogeneous Teased, Dissolved
S0016C *71912988PLM_27*	Lagging Compoud on Ductwork, Loc:29,Engine Room	None Detected	95% Fiber Glass	5% Other	White Fibrous Homogeneous Teased, Dissolved
S0017A *71912988PLM_28*	Client Identified Yellow Suspect Insulation,Loc:29,Engine Roo	None Detected	98% Fiber Glass	2% Other	Yellow Fibrous Homogeneous Teased, Dissolved
S0017B *71912988PLM_29*	Client Identified Yellow Suspect Insulation,Loc:29,Engine Roo	None Detected	98% Fiber Glass	2% Other	Yellow Fibrous Homogeneous Teased, Dissolved
S0017C *71912988PLM_30*	Client Identified Yellow Suspect Insulation,Loc:29,Engine Roo	None Detected	98% Fiber Glass	2% Other	Yellow Fibrous Homogeneous Teased, Dissolved
S0018A *71912988PLM_31*	Ceiling Tiles (lay-in),2x4 Lay In Tile Small Pinhole Pattern,Loc:17,Corridor	None Detected	45% Cellulose 35% Mineral Wool	10% Perlite 10% Other	White Fibrous Homogeneous Ashed, Dissolved

Disclaimer: Due to the nature of the EPA 600 method, asbestos may not be detected in samples containing low levels of asbestos. We strongly recommend that analysis of floor tiles, vermiculite, and/or heterogeneous soil samples be conducted by TEM for confirmation of "None Detected" by PLM. This report relates only to the samples tested and may not be reproduced, except in full, without the written approval of SAI. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. government. Analytical uncertainty available upon request. Scientific Analytical Institute participates in the NVLAP Proficiency Testing program. Unless otherwise noted blank sample correction was not performed. Estimated MDL is 0.1%.

Philip Szabo (51)

Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0018B *71912988PLM_32*	Ceiling Tiles (lay-in),2x4 Lay In Tile Small Pinhole Pattern,Loc:17,Corridor	None Detected	45% Cellulose 35% Mineral Wool	10% Perlite 10% Other	White Fibrous Homogeneous Ashed, Dissolved
S0018C *71912988PLM_33*	Ceiling Tiles (lay-in),2x4 Lay In Tile Small Pinhole Pattern,Loc:17,Corridor	None Detected	45% Cellulose 35% Mineral Wool	10% Perlite 10% Other	White Fibrous Homogeneous Ashed, Dissolved
S0019A *71912988PLM_34*	Suspect Door Core Insulation, Loc:17,Corridor	None Detected	98% Fiber Glass	2% Other	Yellow Fibrous Homogeneous Teased, Dissolved
S0019B *71912988PLM_35*	Suspect Door Core Insulation, Loc:17,Corridor	None Detected	98% Fiber Glass	2% Other	Yellow Fibrous Homogeneous Teased, Dissolved
S0019C *71912988PLM_36*	Suspect Door Core Insulation, Loc:17,Corridor	None Detected	98% Fiber Glass	2% Other	Yellow Fibrous Homogeneous Teased, Dissolved
S0020A *71912988PLM_37*	1/8" Cable,Loc:1,Wheel House	None Detected	30% Cellulose	70% Other	Red Non Fibrous Homogeneous Dissolved
S0020B *71912988PLM_38*	1/8" Cable,Loc:1,Wheel House	None Detected	30% Cellulose	70% Other	Red Non Fibrous Homogeneous Dissolved
S0020C *71912988PLM_39*	1/8" Cable,Loc:1,Wheel House	None Detected	30% Cellulose	70% Other	Red Non Fibrous Homogeneous Dissolved

Philip Szabo (51)

Analyst

Approved Signatory

Bulk Asbestos Analysis

By Polarized Light Microscopy
EPA Method: 600/R-93/116 and 40 CFR, Part 763, Subpart E, App.E

NVLAP Lab Code: 200664-0

Customer: Pinchin Ltd.
5 Superior Street
Tilbury, Ontario N0P 2L0

Attn: Dylan Melo
Graham Rogers
Tayler Deweerd

Lab Order ID: 71912988
Analysis ID: 71912988_PLM
Date Received: 5/15/2019
Date Reported: 5/20/2019

Project: 241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos

Sample ID *Lab Sample ID*	Description *Lab Notes*	Asbestos	Fibrous Components	Non-Fibrous Components	Attributes Treatment
S0021A *71912988PLM_40*	Asbestos-cement (transite),Loc:1,Wheel House	**20% Chrysotile**		**80% Other**	Gray Non Fibrous Homogeneous Dissolved
S0021B *71912988PLM_41*	Asbestos-cement (transite),Loc:1,Wheel House	**Not Analyzed**			
S0021C *71912988PLM_42*	Asbestos-cement (transite),Loc:1,Wheel House	**Not Analyzed**			

Philip Szabo (51)

Analyst

Approved Signatory

T19129888

Version 1-15-2012

Client:	Pinchin Ltd.
Contact:	Dylan Melo
Address:	30 Queen Street South, PO Box 339, Tilbury, ON N0P 2L0
Phone:	519-682-4492
Fax:	519-682-4493
Email:	dmelo@pinchin.com; grogers@pinchin.com; tdeweerd@pinchin.com
Project:	241027,370 Dalhousie St, Amherstburg, On,Coast Guard,CCGS Limnos
Client Notes:	
P.O. #.	241027
Date Submitted:	May 14,2019
Analysis:	PLM - Stop Positive
TurnAroundTime:	4days

Instructions:

Use Column "B" for your contact info

To See an Example Click the bottom Example Tab.

Enter samples between "<<" and ">>"

Begin Samples with a "<< "above the first sample and end with a ">>" below the last sample.

Only Enter your data on the first sheet "Sheet1"

Note: Data 1 and Data 2 are optional fields that do not show up on the official report, however they will be included in the electronic data returned to you to facilitate your reintegration of the report data.

Invoice to:

Contact name here

Email address here

Scientific Analytical Institute

4604 Dundas Dr.

Greensboro, NC 27407

Phone: 336.292.3888

Fax: 336.292.3313

Email: lab@sailab.com

Sample Number	Data 1 (Lab use only)	Sample Description	Data 2 (Lab use only)
<<			
S0008A		Mastic, Black,Loc:6,Lab	
S0008B		Mastic, Black,Loc:6,Lab	
S0008C		Mastic, Black,Loc:6,Lab	
S0009A		Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locker And dry Storage	
S0009B		Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locker And dry Storage	
S0009C		Wall Covering,Brick Pattern Vinyl Sheet Flooring,Loc:16,Utility Locker And dry Storage	
S0010A		Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Officers Mes	
S0010B		Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Officers Mes	
S0010C		Vinyl Sheet Flooring,Grey With Grey And White Smear Pattern,Loc:19,Scientist &Officers Mes	
S0011A		Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32,Focle Hallw	
S0011B		Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32,Focle Hallw	
S0011C		Vinyl Floor Tile And Mastic, 12"x 12" Off White With Brown Streak Pattern, Loc:32,Focle Hallw	

Accepted ☑

Rejected ☐

M. Ireg-Rutlee 5.15 10:30a

S0012A	1/2" Cable,Loc:3,Corridor
S0012B	1/2" Cable,Loc:3,Corridor
S0012C	1/2" Cable,Loc:3,Corridor
S0013A	Firestopping Red (mastic),Loc:16,Utility Locker And dry Storage
S0013B	Firestopping Red (mastic),Loc:1,Wheel House
S0013C	Firestopping Red (mastic),Loc:3,Corridor
S0014A	Brown Window Caulking,Loc:6,Lab
S0014B	Brown Window Caulking,Loc:6,Lab
S0014C	Brown Window Caulking,Loc:6,Lab
S0015A	White Window Caulking,Loc:29,Engine Room
S0015B	White Window Caulking,Loc:29,Engine Room
S0015C	White Window Caulking,Loc:29,Engine Room
S0016A	Lagging Compoud on Ductwork, Loc:29,Engine Room
S0016B	Lagging Compoud on Ductwork, Loc:29,Engine Room
S0016C	Lagging Compoud on Ductwork, Loc:29,Engine Room
S0017A	Client Identified Yellow Suspect Insulation,Loc:29,Engine Room
S0017B	Client Identified Yellow Suspect Insulation,Loc:29,Engine Room
S0017C	Client Identified Yellow Suspect Insulation,Loc:29,Engine Room
S0018A	Ceiling Tiles (lay-in),2x4 Lay In Tile Small Pinhole Pattern,Loc:17,Corridor
S0018B	Ceiling Tiles (lay-in),2x4 Lay In Tile Small Pinhole Pattern,Loc:17,Corridor
S0018C	Ceiling Tiles (lay-in),2x4 Lay In Tile Small Pinhole Pattern,Loc:17,Corridor
S0019A	Suspect Door Core Insulation, Loc:17,Corridor
S0019B	Suspect Door Core Insulation, Loc:17,Corridor
S0019C	Suspect Door Core Insulation, Loc:17,Corridor
S0020A	1/8" Cable,Loc:1,Wheel House
S0020B	1/8" Cable,Loc:1,Wheel House
S0020C	1/8" Cable,Loc:1,Wheel House
S0021A	Asbestos-cement (transite),Loc:1,Wheel House
S0021B	Asbestos-cement (transite),Loc:1,Wheel House
S0021C	Asbestos-cement (transite),Loc:1,Wheel House

>>

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name:	**Canadian Coast Guard, CCG Limnos. Vessel Number 328088, Hamilton Harbour - 47 Discovery Drive, Hamilton, Ontario**		
Project No.:	**0241027.000**		
Prepared For:	**S. Holmquist / T. Manning**		
		Date Received:	**July 3, 2019**
Lab Reference No.:	**b213116**	**Date Analyzed:**	**July 10, 2019**
Analyst(s):	**T. Lam / K. Cockburn**	**# Samples submitted:**	**3**
		# Phases analyzed:	**8**

Method of Analysis:

EPA 600/R-93/116 - Method for the Determination of Asbestos in Bulk Building Materials dated July, 1993

Bulk samples are checked visually and scanned under a stereomicroscope. Slides are prepared and observed under a Polarized Light Microscope (PLM) at magnifications of 40X, 100X or 400X as appropriate. Asbestos fibres are identified by a combination of morphology, colour, refractive index, extinction, sign of elongation, birefringence and dispersion staining colours. A visual estimate is made of the percentage of asbestos present. A reported concentration of less than (<) the regulatory threshold (see chart below) indicates the presence of confirmed asbestos in trace quantities, limited to only a few fibres or fibre bundles in an entire sample. This method complies with provincial regulatory requirements where applicable. Multiple phases within a sample are analyzed and reported separately.

Provincial Jurisdiction	Regulatory Threshold	Provincial Jurisdiction	Regulatory Threshold
Ontario, British Columbia, Nova Scotia	0.5%	Alberta	Undefined
Quebec	0.1%	Saskatchewan	0.5% friable 1% non-friable
PEI, NWT, Yukon, Nunavut, Newfoundland and Labrador, and New Brunswick	1%	Manitoba	0.1% friable 1% non-friable

All bulk samples submitted to this laboratory for asbestos analysis are retained for a minimum of three months. Samples may be retrieved, upon request, for re-examination at any time during that period.

The Pinchin Ltd. Mississauga asbestos laboratory is accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program (NVLAP Lab Code 101270-0) for the 'EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples,' and the 'EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials'; and meets all requirements of ISO/IEC 17025:2005.

This report relates only to the items tested.

Pinchin Ltd. Asbestos Laboratory
Certificate of Analysis

Project Name: Canadian Coast Guard, CCG Limnos. Vessel Number 328088, Hamilton Harbour - 47 Discovery Drive, Hamilton, Ontario
Project No.: 0241027.000
Prepared For: S. Holmquist / T. Manning

Lab Reference No.: b213116
Date Analyzed: July 10, 2019

BULK SAMPLE ANALYSIS

SAMPLE IDENTIFICATION	SAMPLE DESCRIPTION	% COMPOSITION (VISUAL ESTIMATE)	
		ASBESTOS	OTHER
S022A Laminate fibreboard wall, Location 30	3 Phases: a) Homogeneous, black, consolidated, fibrous material. b) Non-homogeneous, beige and brown, soft, sticky material. c) Homogeneous, brown, consolidated, fibrous material.	None Detected None Detected None Detected	Cellulose > 75% Non-Fibrous Material 10-25% Non-Fibrous Material > 75% Cellulose > 75% Non-Fibrous Material 10-25%
Comments:	Cellulose is present on the surface of this sample.		
S022B Laminate fibreboard wall, Location 30	3 Phases: a) Homogeneous, black, consolidated, fibrous material. b) Non-homogeneous, beige and brown, soft, sticky material. c) Homogeneous, brown, consolidated, fibrous material.	None Detected None Detected None Detected	Cellulose > 75% Non-Fibrous Material 10-25% Non-Fibrous Material > 75% Cellulose > 75% Non-Fibrous Material 10-25%
Comments:	Cellulose is present on the surface of this sample.		
S022C Laminate fibreboard wall, Location 30	2 Phases: a) Homogeneous, black, consolidated, fibrous material. b) Non-homogeneous, red and brown, soft, sticky material.	None Detected None Detected	Cellulose > 75% Non-Fibrous Material 10-25% Non-Fibrous Material > 75%
Comments:	Cellulose is present on the surface of this sample.		

Reviewed by: **Reporting Analyst:**

FINCHIN

Analyzed by: TTL

Reviewed by:

Report Sent by:

Instructions:

Pinchin Ltd. - Asbestos Laboratory
Internal Asbestos Bulk Sample Chain of Custody

Client Name:	Canadian Coast Guard			**Project Address:**	Hamilton Harbour - 47 Discovery Drive, Hamilton, Ontario		
Portfolio/Building No:	CCG Limnos, Vessel Number 328088			**Pinchin File:**	241027		
Submitted by:	Stephen Holmquist			**Email:**	sholmquist@pinchin.com		
CC Results to:	Tina Manning			**CC Email:**	tmanning@pinchin.com		
Invoice to:	Tina Manning			**Invoice Email:**	tmanning@pinchin.com		
Date Submitted:	July	2	2019	**Required by:**	July	9	2019
# of Samples:	3			**Priority:**	5 Day Turnaround		
Year of Building Construction (*Mandatory Field*):							
Do NOT Stop on Positive (Sample Numbers):							
Pinchin Group Company (*Mandatory Field*):					Pinchin		

To be Completed by Lab Personnel Only:					
Lab Reference #:	0213116	**Time:**	24 hour clock		
Received by:	JUL 03 2019 JC	**Date:**	Month	Day	Year
Name(s) of Analyst(s):	TTL / KC		July	10	2019

Sample Prefix	Sample No.	Sample Suffix	Sample Description/Location (Mandatory)
	S022	A	Laminate fibreboard wall, Location 30 a) ND b) ND c) ND
	S022	B	Laminate fibreboard wall, Location 30 a) ND b) ND c) ND
	S022	C	Laminate fibreboard wall, Location 33 a) ND b) ND

APPENDIX III
Methodology

1.0 METHODOLOGY

Pinchin conducts an inspection of previously identified asbestos-containing materials (ACM) to evaluate the current condition of all accessible identified in the most recent assessment. The surveyor makes reference to any existing assessment or abatement reports (as provided by the Client).

1.1 Limitations on Scope

The re-assessment excludes the following:

- Articles belonging to the owner, tenant or occupant (e.g. stored items, furniture, appliances, etc.);
- Underground materials or equipment (e.g. vessels, drums, underground storage tanks, pipes, etc.);
- Building envelope, structural components, inaccessible or concealed materials or other items where sampling may cause consequential damage to the property.
- Energized systems (e.g. internal boiler components, elevators, mechanical or electrical components);
- Controlled products (e.g. stored chemicals, operational or process-related substances); and
- Materials not typically associated with construction (e.g. settled dust, spills, residual contamination from prior spills, etc.).

As per the original scope of work, concealed locations such as ceiling spaces above solid ceilings, shafts and chases are accessed via existing access panels. Our investigation does not include demolition of drywall or plaster walls to view concealed conditions. Structural items or exterior building finishes are not removed to determine the presence of concealed materials.

1.2 Methodology

Existing sampling data is reviewed and relied upon. If sampling is conducted, samples are collected at a rate that is in compliance with the requirements of local regulations and guidelines. The sampling strategy is also based on known ban dates and phase out dates of the use of asbestos; sampling of certain building materials is not conducted after specific construction dates. In addition, to be conservative, several years past these dates are added to account for some uncertainty in the exact start / finish date of construction and associated usage of ACM.

Materials listed as exclusions in the previous reports remain as exclusions. Sampling, assessment or verification of excluded materials was not conducted.

If present, the following materials are presumed to be asbestos-containing and are best sampled immediately prior to commencing renovation/disturbance:

- Roofing felts and tar, including repair mastics
- Concrete floor levelling compound, including ceramic tile thin set
- Elevator and lift brakes
- Electrical components or wiring within control centers, breakers, motors or lights, insulation on wiring
- Moulded plastic components (laboratory bench tops)
- Refractory materials and insulations in boilers, incinerators and stacks
- Insulation under metal clad boilers and vessels
- Mechanical packing, ropes and gaskets
- Adhesives and duct mastics
- Caulking and putties
- Paints and coatings
- Paper products under wood flooring or metal or slate roofing
- Soffit and fascia boards at elevated heights
- Exterior cladding
- Stucco, plaster or other cementitious parge coatings
- Vibration dampers on HVAC equipment
- Materials outside the assessed area

2.0 ANALYSIS AND IDENTIFICATION OF ASBESTOS MATERIALS

Pinchin relies on the analytical results of prior surveys. Asbestos bulk samples (if required) are analyzed at an independent NVLAP accredited laboratory. Preliminary identification of asbestos fibres is made using polarized light microscopy, with confirmation of the presence and type of asbestos made by dispersion staining optical microscopy. The analysis is performed in accordance with Test Method EPA/600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials, June 1993. All independent laboratories used by Pinchin, including our laboratory, are certified under the National Voluntary Laboratory Accreditation Program (NVLAP) to perform asbestos analysis of bulk samples.

Analytical results are compared to the following criteria.

Jurisdiction	Friable	Non-Friable
BC	0.5%[1]	0.5%
Alberta	Undefined[2]	Undefined[2]
Saskatchewan	>0.5%[1]	>1%
Manitoba	0.1%[1]	1%
Ontario	0.5%	0.5%
Yukon, Nunavut, Northwest Territories	1%	1%
Federal	1%	1%

The asbestos analysis is completed using a stop positive approach. Only one result meeting the above regulated criteria is required to determine that a material is asbestos-containing, but all samples must be analyzed to conclusively determine that a material is non-asbestos. The laboratory stops analyzing samples from a homogeneous material once a result equal to or greater than the regulated criteria is detected in any of the samples of that material. All samples of a homogeneous material are analyzed if no asbestos is detected. In some cases, all samples are analyzed in the sample set regardless of result.

Where building materials are described in the report as “non-asbestos” or “does not contain asbestos”, this means that either no asbestos was detected by the analytical method utilized in any of the multiple samples or, if detected, it is below the lower limit of an asbestos-containing material in the applicable regulation.

Asbestos materials are evaluated in order to make recommendations regarding remedial work. The priority for remedial action is based on several factors:

- Friability (friable or non-friable).
- Condition (good, fair, poor, debris).
- Accessibility (ranking from accessible to all building users to inaccessible).
- Visibility (whether the material is obscured by other building components).
- Efficiency of the work (for example, if damaged ACM is being removed in an area, it may be most practical to remove all ACM in the area even if it is in good condition).

For a complete description of the Evaluation Criteria and Basis of Recommendations, refer to Annex A.

Template: Methodology for Asbestos Re-Assessment, HAZ, April 3, 2019

[1] Or any amount if vermiculite
[2] There is no criteria established for defining an asbestos-containing material by Alberta OHS Regulations. Historically, the accepted threshold was 1%, however materials that contain any asbestos will now need to be assessed before disturbance to determine the potential for fibre release based on the planned work activity.

METHODOLOGY ANNEX A EVALUATION CRITERIA

1.0 EVALUATION CRITERIA AND BASIS OF RECOMMENDATIONS

The detailed asbestos assessment provides information regarding the location, condition, accessibility and friability of the asbestos-containing materials (ACM). In order to make recommendations for compliance with current regulations, Pinchin developed the following criteria.

2.0 EVALUATION OF CONDITION

2.1 Friable Sprayed or Trowelled Fireproofing, Thermal Insulation and Texture Finishes (Surfacing Materials)

To evaluate the condition of ACM sprayed or trowelled on fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes, the following criteria are applied:

Good	Surface of material shows no significant signs of damage, deterioration or delamination. Good condition includes unencapsulated or unpainted fireproofing or texture finishes, where no or limited delamination or damage is observed, or encapsulated fireproofing or texture finishes where the encapsulant or paint has been applied after the damage or fallout occurred.
Poor	A sprayed material that shows signs of significant damage or is significantly delaminating or deteriorating. This may be limited to surface delamination or some portion of the substrate may be exposed.

In Locations where damage exists in isolated areas, both good and poor condition may be applicable. The extent of each condition will be recorded. Fair condition is not utilized in the evaluation of ACM sprayed or trowelled fireproofing, sprayed or trowelled thermal insulation (non-mechanical), or texture, decorative or acoustic finishes.

The evaluation of the above products above ceilings may be limited by the number of observations and by building components such as ducts or full height walls that obstruct the above ceiling observations.

2.2 Friable Mechanical or Thermal System Insulation (TSI)

To evaluate the condition of mechanical insulation on vessels, boilers, breeching, ducts, pipes, fan units, equipment etc. the following criteria are applied:

Good	Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor damage (i.e. scuffs or stains), but the jacketing is not penetrated.
Fair	Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges from minor to none. Damage can be repaired.

Poor	Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. Includes components where insulation may have been removed incompletely.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is often not possible to observe each foot of mechanical insulation from all angles.

2.3 Potentially Friable Materials and Miscellaneous Friable Materials

Potentially friable ACM are products that are basically non-friable while in place, but have the potential to generate friable dust upon removal or if significantly disturbed without appropriate procedures. These products may become friable if damaged. Potentially friable materials include materials such as acoustic ceiling tiles and plaster. To evaluate the condition of potentially friable materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.
Fair	Showing signs of some cracking or breakage, but is not deteriorating (e.g. cracked plaster, broken but in place ceiling tile, missing tile or section of plaster etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material has deteriorated to a point it has become friable. Normally potentially friable ACM in Poor condition is not repairable and requires at least localized removal and replacement.

2.4 Non-Friable Materials

Non-friable ACM cover a wide range of products with a wide variation in their tendency to release dust or asbestos fibres to the air. Many of these materials, (particularly where the matrix is an unweathered bitumen, asphalt or tar material) do not release fibres except in very unusual circumstances or during significant disturbance (e.g. use of abrasive power tools). Others with a cementitious matrix (asbestos-cement products) can more readily release dust due to abrasion, demolition, weathering, etc. The potential for asbestos release from non-friable ACM is always lower than from friable ACM. To evaluate the condition of non-friable Materials, the following criteria are applied:

Good	No significant damage or deterioration. Still serving its intended use as a building material or finish.

Fair	Showing signs of some cracking or breakage, but is not deteriorating (e.g. cracked vinyl floor tile, missing piece of tile or transite, etc.). The condition is such that it is still serving its intended use as a building material or finish but may require repair for mainly cosmetic purposes.
Poor	Significant deterioration or breaking apart of the material to the point at which it cannot be repaired and it will require at least local removal. Material has deteriorated to the point it is not serving its intended use as building material or finish. Material may have deteriorated to a point where traffic or disturbance may cause it to become friable.

2.5 Evaluation of ACM Debris

The identification of the exact location or presence of debris on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations.

The presence of fallen or dislodged ACM is noted separately from the ACM source and is referred to as Debris. Debris may be friable if from a friable ACM source or a badly deteriorated non-friable ACM source. Debris may also be non-friable (such as fallen pieces of transite sheet or mastic fittings, or broken, dislodged floor tiles).

Debris	Debris may be friable or non-friable, but is always identified as debris.

2.6 Evaluation of Presumed Asbestos-Containing Material (PACM)

Presumed asbestos-containing materials (PACM), are building materials that may contain asbestos but were not sampled or analyzed due to inaccessibility or the need to perform destructive testing to obtain a reasonable sample set. Evaluation of these materials is based on the assumption that these PACM are asbestos-containing.

A list of PACM is provided in the report and they are generally not included in the detailed room by room reports. Typically they are excluded because they are inaccessible or present in very small quantities. If PACM are evaluated, Pinchin uses the criteria that correspond with the type (and friability) of the material listed above.

3.0 EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

Access (A)	Common areas of the building within reach of all building users (approximately 8 '-9' from floor or standard ceiling height). Includes other areas where occupant activities may result in disturbance of material that is not normally within reach from floor level, but may be disturbed by common activities (e.g. gymnasiums, workshops, warehouses)
Access (B)	Areas of the building accessed primarily by Maintenance/Caretaking/Janitorial Staff and within reach without use of a ladder. Includes areas within reach in Boiler Rooms, Electrical Rooms, Janitors Closets, Elevator Rooms, Mechanical Rooms, etc. Includes materials within reach from fixed ladders or catwalks, mezzanines, and accessible pipe chases.
Access (C) and Visible	Areas of the building above 8' - 9' where use of a ladder or scaffold is required to reach the ACM. Only includes ACM that are visible to view without the removal or opening of other building components such as ceiling tiles or service access panels. Visible column on HMIS sheets will say YES.
Access (C) and not Visible	Areas of the building above 8' - 9' where use of a ladder or scaffold is required to reach the ACM. Includes ACM that are not visible to view and require the removal of a building component to see, such as ceilings tiles or access panels to view and access. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points. Visible column on HMIS sheets will say NO.
Access (D)	Areas of the building behind inaccessible solid ceiling systems, walls or equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the ACM. Material inaccessible due to height or location or is only accessed under unusual situations. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in Access D.

4.0 ACTION MATRIX AND DEFINITIONS

Pinchin's evaluation of the viability of a specific asbestos control option is based on the consideration of the friability, condition, accessibility and visibility of a material. The logic used is that damaged ACM located in an area frequently accessed by all building occupants is of a higher priority than damaged ACM located in an infrequently accessed service area. The action matrix considers the potential for fibre release (primarily from friable ACM) and the possible concerns from regulatory bodies and many building occupants to all damaged ACM (including non-friable).

In any building with asbestos, many current regulations require an Asbestos Management Program be implemented. Depending on the condition and the accessibility, more active measures such as repair or removal may be recommended. The following matrix provides guidance for recommended Actions in the absence of renovation or demolition. In the event of construction or maintenance activity which will disturb ACM more aggressive control or removal will be required.

4.1 Action Matrix

The following tables outline the action decisions based on the relationship of assessed factors. Table I applies to friable ACM. Table II applies to non-friable ACM.

Table I Decision Matrix for Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 5[1]	Action 5[2]	Action 3	Action 1
(B)	Action 7	Action 6[3]	Action 3	Action 1
(C) Visible	Action 7	Action 6	Action 3	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

Table II Decision Matrix for Potentially Friable and Non-Friable ACM

Access	Condition			Debris
	Good	Fair	Poor	
(A)	Action 7	Action 7[4]	Action 3	Action 1
(B)	Action 7	Action 7	Action 3	Action 1
(C) Visible	Action 7	Action 7	Action 4	Action 2
(C) Not Visible	Action 7	Action 7	Action 4	Action 2
(D)	Action 7	Action 7	Action 7	Action 7

4.2 Action Definitions

The following are the definitions in the Action Matrix Table presented above:

Action Definitions	
Action 1	Clean-Up of ACM Debris Restrict access that is likely to cause a disturbance of the ACM Debris and clean up ACM Debris. Utilize appropriate asbestos precautions.

[1] If friable ACM in access (A)/Good condition is not proactively removed Action 7 (Manage) is recommended.

[2] If friable ACM in access (A)/Fair condition is not proactively removed repair is recommended.

[3] If friable ACM in access (B)/Fair condition is likely to be disturbed after repair proactive removal is recommended.

[4] Action 7 is recommended for all non-friable ACM in Fair condition however some clients may wish to repair or take some action primarily for cosmetic reasons

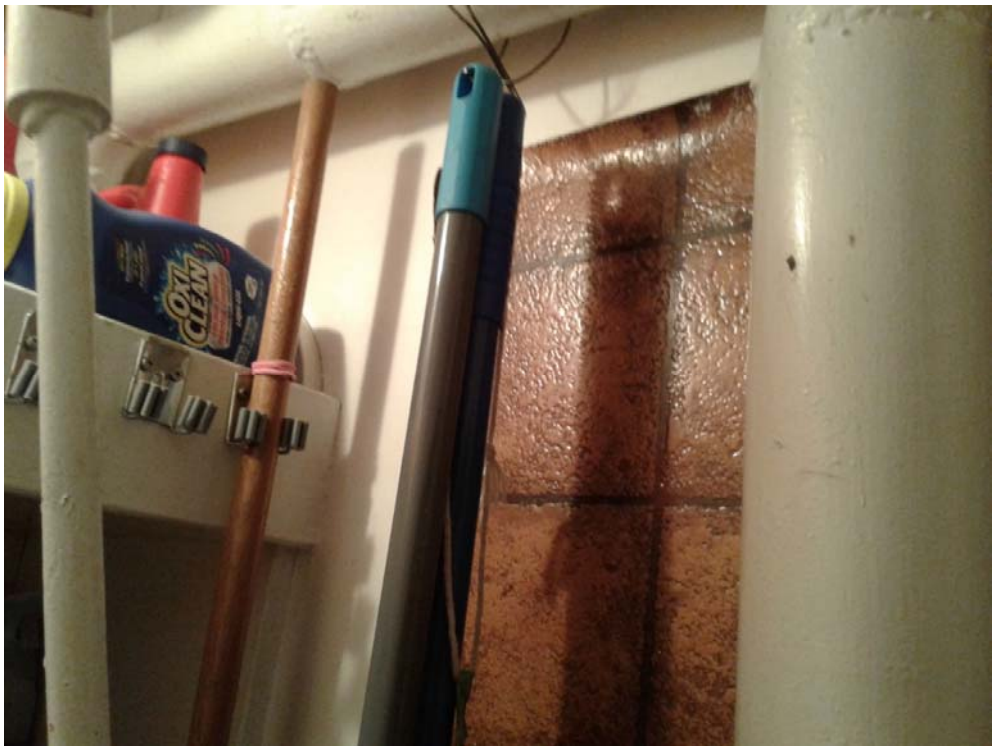
Action Definitions	
Action 2	Precautions for Access Which may Disturb ACM Debris Use appropriate means to isolate the debris or to limit entry to the area which may disturb the material. At locations where ACM Debris can remain in place in lieu of removal or clean-up (e.g. Debris on top of ceiling tiles or behind lockable door), Utilize appropriate asbestos precautions to enter the area if this will disturb debris. The precautions will be required until the ACM Debris has been cleaned up.
Action 3	ACM Removal Remove ACM. Utilize asbestos procedures appropriate to the scope of the removal work. Until it is removed, restrict access to the material so it is not disturbed.
Action 4	Precautions for Work Which may Disturb ACM in Poor Condition. Utilize appropriate asbestos precautions if ACM may be disturbed by work on or near ACM. This does not require restricting access to the area, only control of work which may contact or disturb the ACM. Removal is the only viable option if work will disturb ACM.
Action 5	Proactive ACM Removal Remove friable ACM where the presence of friable asbestos in Good condition is not desirable. If friable ACM in Fair condition is not removed then Repair friable ACM.
Action 6	ACM Repair Repair friable ACM in Fair condition which is not likely to be damaged again or disturbed by normal use of the area or room. Pinchin recommends proactive removal if friable ACM is likely to be damaged or disturbed during normal use of the area or room
Action 7	Asbestos Management Program with Routine Surveillance Implement an Asbestos Management Program, including routine surveillance of ACM. Reassess materials regularly (typically once per year).

Master Template: Methodology Annex A to Appendix I Evaluation Criteria, HAZ, April 3, 2019

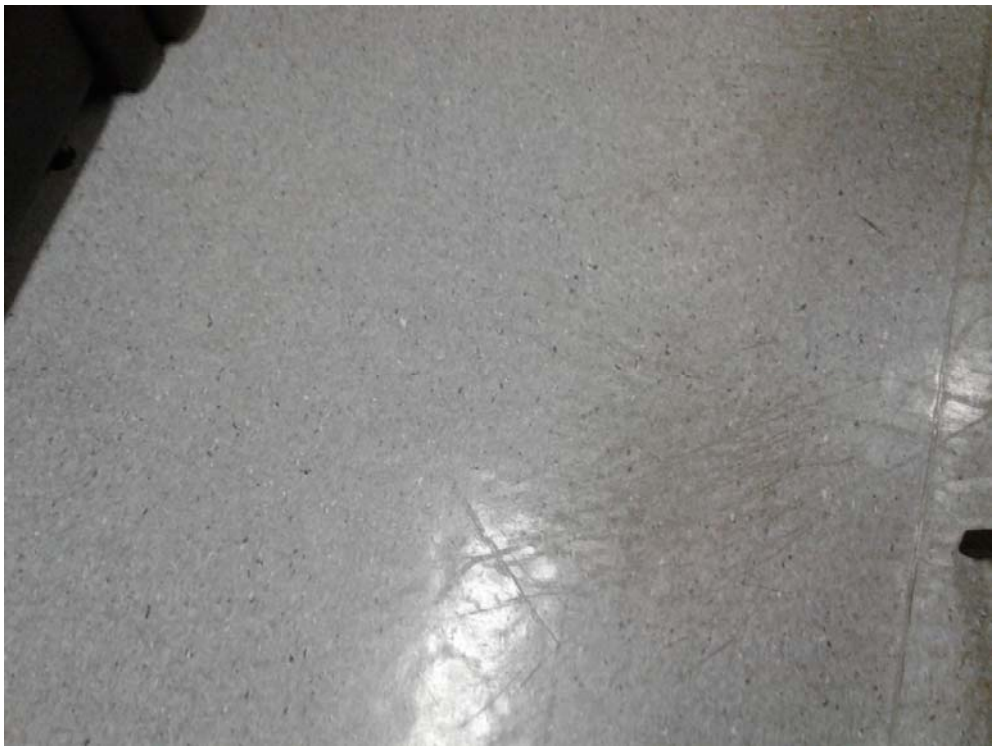
APPENDIX IV

Additional Photographs

Vinyl Floor Tile and Mastic, In closet 9x9 grey painted brown with brown streak, V9000, Corridor (Loc. 3)



Wall covering, Brick pattern vinyl sheet flooring, S0009C, Utility Locker And dry Storage (Loc. 16)



Vinyl Sheet Flooring, Grey with grey and white smear pattern, S0010A, Scientist & Officers Mess (Loc. 19)

Vinyl Sheet Flooring, New install, , Crew's Mess (Loc. 21)

APPENDIX V

Location Summary Report

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

ASBESTOS SUMMARY REPORT

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:Canadian Coast Guard
Site: , , ON **Building Name: CCGS Limnos**
Surveyor: Pinchin **Survey Date:** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

System	Asbestos	Friable	ACM Materials	Locations where ACM materials are present - Location(Room Number)	Recommended Actions	Quantity
C - Ceiling	No	No				
		Yes				
D - Duct	No	No				
		Yes				
F - Floor	Yes	No				
		No	Vinyl Floor Tile and Mastic	3, 31	7	120 SF
M - Mechanical Equipment	No	No				
		Yes				
O - Other	No	No				
		Yes				
P - Piping	No	No				
		Yes				
S - Structure	No	No				
		Yes				
W - Wall	Yes	No				
		No	Asbestos-cement (Transite)	1	7	18 SF

APPENDIX VI

Asbestos Material Summary Report

HMIS
HAZARDOUS MATERIALS INVENTORY SYSTEM

HAZARDOUS MATERIALS SUMMARY / SAMPLE LOG

PINCHIN
1.855.PINCHIN www.pinchin.com

Client:Canadian Coast Guard **Site: , , ON** **Building Name: CCGS Limnos** **Surveyor: Pinchin** **Survey Date:**

HAZMAT	Sample No	System/Material/Sample Description	Locations	LF	SF	EA	%	Type	Positive
Asbestos	S0002	STRUCTURE | |	1,2,3,4,5,6,12,13,14,32	0	700	0	100	None Detected	No
Asbestos	S0003	FLOOR | VINYL FLOOR TILE AND MASTIC |	3,31	0	90	0	0	Chrysotile	Yes
Asbestos	S0008 ABC	OTHER | MASTIC, BLACK |	6	0	20	0	0	None Detected	No
Asbestos	S0009 ABC	WALL | WALL COVERING | BRICK PATTERN VINYL SHEET FLOORING	16	0	45	0	0	None Detected	No
Asbestos	S0010 ABC	FLOOR | VINYL SHEET FLOORING | GREY WITH GREY AND WHITE SMEAR PATTERN	19	0	675	0	0	None Detected	No
Asbestos	S0011 ABC	FLOOR | VINYL FLOOR TILE AND MASTIC |	32	0	0	0	33	None Detected	No
Asbestos	S0012 ABC	OTHER | CONDUIT |	3	0	0	0	33	None Detected	No
Asbestos	S0013 ABC	OTHER | FIRESTOPPING (MASTIC) |	1,3,16	0	7	0	0	None Detected	No
Asbestos	S0014 ABC	OTHER | CAULKING |	6	30	0	0	0	None Detected	No
Asbestos	S0015 ABC	OTHER | CAULKING |	29	60	0	0	0	None Detected	No
Asbestos	S0016 ABC	DUCT | |	29	0	0	0	100	None Detected	No
Asbestos	S0017 ABC	OTHER, WALL | FIBREGLASS |	16,29	0	0	2	100	None Detected	No
Asbestos	S0018 ABC	CEILING | CEILING TILES (LAY-IN) | 2X4 LAY IN TILE SMALL PINHOLE	17	0	8	0	0	None Detected	No
Asbestos	S0019 ABC	OTHER, WALL | THERMAL INSULATION |	17,20,32	0	26	5	0	None Detected	No
Asbestos	S0020 ABC	OTHER | CONDUIT |	1	0	0	0	100	None Detected	No
Asbestos	S0021 ABC	WALL | ASBESTOS-CEMENT (TRANSITE) |	1	0	18	0	0	Chrysotile	Yes
Asbestos	S0022 ABC	CEILING, WALL | FIBROUS BOARD | LAMINATE FIBERBOARD WALL	30,33	0	40	0	100	None Detected	No
Asbestos	V9000	FLOOR | VINYL FLOOR TILE AND MASTIC	3	0	30	0	0	Confirmed Asbestos	Yes
Asbestos	V0000	CEILING | METAL |	1,2,3,4,5,6,12,13,14	0	730	0	100	Non Asbestos	No
Asbestos	V0000	FLOOR | ABATED MATERIAL |	1,2,26,29	0	350	0	100	Non Asbestos	No
Asbestos	V0000	PIPING | NOT INSULATED	16,31	0	0	0	0	Non Asbestos	No

APPENDIX VII

All Data Report

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #1 : Wheel House **Floor: NA** **Room #:** **Area (sqft): 200**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		100			%	V0000	Non-Asbestos		None
Duct		Fibreglass			D	N		6			LF				
Floor		Carpet			A	Y		200			SF				
Floor		Abated Material			A	N		200			SF	V0000	Non-Asbestos		None
Other	Cable	Conduit			B	N		300			%	S0020ABC	None Detected	N.D.	None
Other	Conduit	Firestopping (mastic)			C	Y		2			SF	S0013B	None Detected	N.D.	None
Structure					D	N		200			SF	S0002	None Detected	N.D.	None
Structure		Steel			D	N		200			SF				
Wall		Steel			B	N		260			SF				
Wall		Wood			A	Y		260			SF				
Wall		Asbestos-cement (Transite)			B	N		18			SF	S0021ABC	Chrysotile	10-25%	Confirmed Asbestos(NF)
Wall		Fibreglass			B	Y		260			SF				

Ceiling - Fiberglass with White Textile Covering

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #2 : Cabin 3 **Floor: Forecastle** **Room #:** **Area (sqft): 200**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		100			%	V0000	Non-Asbestos		None
Duct		Fibreglass			D	N		6			LF				
Duct	Return Air	Not Insulated			A	Y		10			LF				
Floor		Carpet			A	Y		100			%				
Floor		Abated Material			A	N		100			%	V0000	Non-Asbestos		None
Other[1]	Sink														
Piping		Armaflex			B	N		5			LF				
Piping		Not Insulated			A	Y		3			LF				
Structure					D	N		200			SF	V0002	None Detected	N.D.	None
Structure		Steel			D	N		200			SF				
Structure		Fibreglass			B	N		200			SF	V0002	None Detected	N.D.	None
Wall		Steel			B	N		260			SF				
Wall		Wood													
Wall		Fibreglass			B	Y		260			SF				

Floor abated 2010
1 - Uninsulared and painted

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #3 : Corridor **Floor: Forecastle** **Room #:** **Area (sqft): 120**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		100			%	V0000	Non-Asbestos		None
Floor		Vinyl Floor Tile and Mastic			A	Y		90			SF	S0003	Chrysotile	5-10%	Confirmed Asbestos(NF)
Floor		Vinyl Floor Tile and Mastic, In closet 9x9 grey painted brown with brown streak		Paint	A	N		30			SF	V9000	Confirmed Asbestos		Confirmed Asbestos(NF)
Other	Conduit	Conduit			B	Y		100			%	S0012ABC	None Detected	N.D.	None
Other	Conduit	Caulking			B	Y		2			SF	S0013C	None Detected	N.D.	None
Structure		Steel			B	N		100			%				
Structure		Fibreglass			B	N		100			%	V0002	None Detected	N.D.	None
Wall		Steel													

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #4 : Cabin 1 **Floor: Forecastle** **Room #:** **Area (sqft): 160**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		160			SF	V0000	Non-Asbestos		None
Duct		Fibreglass			D	N		6			LF				
Floor		Carpet			A	Y		160			SF				
Structure					D	N		100			%	V0002	None Detected	N.D.	None
Structure		Steel			D	N		100			%				
Wall		Wood													

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #5 : Cabin 2 **Floor: Forecastle** **Room #:** **Area (sqft): 110**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		110			SF	V0000	Non-Asbestos		None
Duct		Fibreglass			B	N		6			LF				
Floor		Carpet			A	Y		110			SF				
Structure		Steel			B	N		100			%				
Structure		Fibreglass			B	N		100			%	V0002	None Detected	N.D.	None
Wall		Wood													

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #6 : Lab **Floor: Main Deck** **Room #:** **Area (sqft): 400**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		200			SF	V0000	Non-Asbestos		None
Duct	Supply Air	Fibreglass			B	N		10			LF				
Floor		Terrazzo			A	Y		400			SF				
Other	Sink	Mastic, Black			A	N		20			SF	S0008ABC	None Detected	N.D.	None
Other	Window	Caulking			A	Y		30			LF	S0014ABC	None Detected	N.D.	None
Piping		Not Insulated			B	N		10			LF				
Structure		Steel			B	N		100			%				
Structure		Fibreglass			B	N		100			%	V0002	None Detected	N.D.	None
Wall		Laminate			A	Y		100			%				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #7 : Storage **Floor: Main Deck** **Room #:** **Area (sqft): 240**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Fibreglass			C	Y		240			SF				
Duct		Armaflex			A	Y		20			LF				
Floor		Concrete (poured)			A	Y		240			SF				
Piping		Not Insulated			B	Y		50			LF				
Piping		Not Insulated			A	Y		10			LF				
Piping		Not Insulated			A	Y		10			LF				
Structure		Steel													
Wall		Steel			A	Y		160			SF				
Wall		Fibreglass			A	Y		100			%				
Wall		Laminate			A	Y		100			%				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #8 : 2 Technicians - Cabin 16 **Floor: Main Deck** **Room #:** **Area (sqft): 70**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Fibreglass			C	Y		70			SF				
Duct	Supply Air	Fibreglass			C	Y		3			LF				
Floor		Carpet			A	Y		70			SF				
Piping		Not Insulated			A	Y		16			LF				
Wall		Fibreglass			A	Y		80			SF				
Wall		Laminate			A	Y		80			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #9 : Cabin 15 **Floor: Main Deck** **Room #:** **Area (sqft): 70**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Fibreglass			C	Y		70			SF				
Duct	Supply Air	Fibreglass			C	Y		3			LF				
Floor		Carpet			A	Y		70			SF				
Piping		Not Insulated			A	Y		16			LF				
Wall		Fibreglass			A	Y		80			SF				
Wall		Laminate			A	Y		80			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #10 : Tank/Pump Compartment **Floor: Below Main** **Room #:** **Area (sqft): 250**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			C	Y		250			SF				
Floor		Steel			A	Y		125			SF				
Floor		Concrete (poured)			A	Y		125			SF				
Mechanical Equipment	Tank	Not Insulated			A	Y		50			SF				
Mechanical Equipment	Tank	Not Insulated			A	Y		400			SF				
Mechanical Equipment	Tank	Not Insulated			A	Y		100			SF				
Mechanical Equipment	Tank	Not Insulated			A	Y		200			SF				
Piping		Fibreglass			A	Y		25			LF				
Piping		Fibreglass			A	Y		50			LF				
Piping		Fibreglass			A	Y		50			LF				
Piping		Not Insulated			A	Y		100			LF				
Piping		Not Insulated			A	Y		100			LF				
Piping		Not Insulated			A	Y		10			LF				
Structure		Steel			C	Y		250			SF				
Wall		Fibreglass			A	Y		500			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #11 : Head **Floor: Main Deck** **Room #:** **Area (sqft): 65**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		65			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		65			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #12 : OIC **Floor: Under Main** **Room #:** **Area (sqft): 120**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		130			SF	V0000	Non-Asbestos		None
Duct		Fibreglass			C	N		10			LF				
Floor		Ceramic Tiles													
Floor		Carpet			A	Y		120			SF				
Piping		Fibreglass			A	Y		10			LF				
Piping		Not Insulated			C	N		10			LF				
Structure		Steel			B	N		100			%				
Structure		Fibreglass			B	N		100			%	V0002	None Detected	N.D.	None
Wall		Steel			A	Y		120			SF				
Wall		Wood			A	Y		140			SF				
Wall		Fibreglass	Fitting		A	Y		5			EA				

Fiberglass Behind Wall, Firedoor at Corridor and Washroom

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #13 : Chief Eng. Cabin **Floor: Under Main** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		130			SF	V0000	Non-Asbestos		None
Duct		Fibreglass			C	N		10			LF				
Floor		Ceramic Tiles													
Floor		Carpet			A	Y		120			SF				
Piping		Fibreglass			A	Y		10			LF				
Piping		Not Insulated			C	N		10			LF				
Structure		Steel			B	N		100			SF				
Structure		Fibreglass			B	N		100			SF	V0002	None Detected	N.D.	None
Wall		Steel			A	Y		120			SF				
Wall		Wood			A	Y		140			SF				

Fiberglass Behind Wall, Firedoor at Corridor and Washroom

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #14 : Engineer (2) Cabin 6 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Metal			A	Y		100			%	V0000	Non-Asbestos		None
Duct		Fibreglass			C	N		10			LF				
Floor		Ceramic Tiles													
Floor		Carpet			A	Y		120			SF				
Piping		Fibreglass			A	Y		10			LF				
Piping		Not Insulated			C	N		10			LF				
Structure		Steel			B	N		100			%				
Structure		Fibreglass			B	N		100			%	V0002	None Detected	N.D.	None
Wall		Steel			A	Y		120			SF				
Wall		Wood			A	Y		140			SF				

Fiberglass Behind Wall, Firedoor at Corridor and Washroom

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #15 : Cabin 7 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		100			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #16 : Utility Locker And dry Storage **Floor: Under Main** **Room #:** **Area (sqft): 6**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		6			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		6			SF				
Other	Conduit	Firestopping (mastic)			C	Y		3			SF	S0013A	None Detected	N.D.	None
Other	Door	Thermal Insulation			D	N		2			EA	V0017	None Detected	N.D.	None
Piping		Fibreglass			B	N		3		.5	LF				
Piping		Not Insulated			A	Y		12			SF				
Piping	All	Fibreglass		Plastic	A	Y									
Piping	All	Not Insulated			B	N						V0000	Non-Asbestos		None
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				
Wall		Wall covering, Brick pattern vinyl sheet flooring			B	N		45			SF	S0009ABC	None Detected	N.D.	None
Wall[1]		Abated Material	Fitting		B	N		.5				S0004	Chrysotile	10-25%	None

1 - No parging cement observed all fittings plastic covering fiberglass

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #17 : Corridor **Floor: NA** **Room #:** **Area (sqft): 180**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		65			SF				
Ceiling		Ceiling Tiles (lay-in), 2x4 lay in tile small pinhole			B	Y		8			SF	S0018ABC	None Detected	N.D.	None
Duct		Armaflex			A	Y		12			SF				
Floor		Steel			A	Y		40			SF				
Floor		Carpet			A	Y		100			%				
Other	Door	Thermal Insulation			D	N		4			EA	S0019AB	None Detected	N.D.	None
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel													

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #18 : Galley **Floor: NA** **Room #:** **Area (sqft): 200**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		200			SF				
Floor		Ceramic Tiles			A	Y		200			SF				
Wall		Steel			A	Y		420			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #19 : Scientist & Officers Mess **Floor: NA** **Room #:** **Area (sqft): 225**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		225			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Vinyl Sheet Flooring, Grey with grey and white smear pattern			A	Y		675			SF	S0010ABC	None Detected	N.D.	None
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Wood			A	Y		240			SF				
Wall		Drywall and joint compound			A	Y		240			SF				

Dry Wall Covered with Wallpaper and Wood Strip at Joints

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #20 : 2 Showers & 2 Washrooms **Floor: NA** **Room #:** **Area (sqft): 150**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		150			SF				
Duct		Armaflex			A	Y		4			LF				
Floor		Ceramic Tiles			A	Y		150			SF				
Piping		Fibreglass			A	Y		6			LF				
Piping		Armaflex			A	Y		10			LF				
Wall		Steel			A	Y		250			SF				
Wall	Door	Thermal Insulation		Metal	A	Y		21			SF	S0019	None Detected	N.D.	None

4 Doors, 1 Damaged at Washroom

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #21 : Crew's Mess **Floor: NA** **Room #:** **Area (sqft): 250**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		250			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Vinyl Sheet Flooring, New install			A	Y		250			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #22 : Cabin 9 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		100			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		100			%				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #23 : Cabin 8 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		100			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #24 : Cabin 11 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		100			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #25 : Cabin 13 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		100			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Steel Door

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #26 : Cabin 10 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Abated Material			A	Y		100			SF	V0000	Non-Asbestos		None
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #27 : Cabin 12 **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		100			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #28 : Cabin 14 **Floor: NA** **Room #:** **Area (sqft): 0**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		65			SF				
Duct		Armaflex			A	Y		12			SF				
Floor		Concrete (precast)			A	Y		65			SF				
Piping		Not Insulated			A	Y		12			SF				
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #29 : Engine Room **Floor: NA** **Room #:** **Area (sqft): 600**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			C	Y		600			SF				
Duct				Sacking compound	A	Y		300			%	S0016ABC	None Detected	N.D.	None
Duct		Fibreglass		Canvas	A	Y		100							
Duct		Not Insulated			A	Y		50			LF				
Floor		Steel			A	Y		600			SF				
Floor		Abated Material			B	Y		50			SF	V0000	Non-Asbestos		None
Mechanical Equipment	Generator Exhaust	Fibreglass		Textile	A	Y		30			LF				
Other[1]	Door			Metal	D	N		100				V0000	Non-Asbestos		None
Other	Window	Caulking			B	Y		60			LF	S0015ABC	None Detected	N.D.	None
Piping		Fibreglass			A	Y		60			LF				
Piping		Not Insulated			A	Y		100			LF				
Structure		Steel			C	Y		600			SF				
Wall		Steel			A	Y		400			SF				
Wall		Fibreglass		Canvas	A	N		300			%	S0017ABC	None Detected	N.D.	None

Door to Engine Room, Control Room Fire Door
1 - Door was said to be replaced in 2005 according to Former Report, Pinchin file 28432

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #30 : Diesel Generator Room **Floor: NA** **Room #:** **Area (sqft): 100**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		100			SF				
Floor		Steel			A	Y		100			SF				
Piping		Fibreglass			A	Y		2			LF				
Structure		Steel			A	Y		100			SF				
Wall		Steel			A	Y		280			SF				
Wall		Fibrous Board, Laminate fiberboard wall			A	Y		200			%	S0022AB	None Detected	N.D.	None

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #31 : Boot Room Old Incerator Roon **Floor: LOWER DECK** **Room #:** **Area (sqft): 10**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS														
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Steel			A	Y		6			SF				
Duct		Armaflex			A	Y		12			SF				
Floor[1]		Vinyl Floor Tile and Mastic			A	Y						V0003	Chrysotile	5-10%	Confirmed Asbestos(NF)
Piping		Fibreglass		Canvas	B	N					LF				
Piping	All	Not Insulated			B	N						V0000	Non-Asbestos		None
Structure		Steel			C	Y		65			SF				
Wall		Steel			A	Y		260			SF				

1 - 9x9 painted grey

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #32 : Focle Hallway **Floor: MID** **Room #:** **Area (sqft): 25**
Surveyor: Pinchin **Survey Date: 2019-05-13** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Floor		Vinyl Floor Tile and Mastic			A	Y		100			%	S0011ABC	None Detected	N.D.	None
Other	Door	Thermal Insulation			D	N		1			EA	S0019C	None Detected	N.D.	None
Structure		Steel			B	N		100			%				
Structure		Fibreglass			B	N		100			%	V0002	None Detected	N.D.	None
Wall		Steel													

Client: Canadian Coast Guard **Site: Vessels** **Building Name: 328088 : CCGS Limnos**
Location: #33 : Lamp Locker **Floor:** **Room #:** **Area (sqft): 0**
Surveyor: Pinchin **Survey Date:** **Reassessment Surveyor: Dylan Melo** **Last Re-Assessment: 2019-05-13**

ASBESTOS															
System	Component	Material	Item	Covering	A*	V*	AP*	Good	Fair	Poor	Unit	Sample	Asbestos Type	Amount	Hazard
Ceiling		Fibrous Board, Laminate fiberboard			C	Y		40			SF	V0022	None Detected	N.D.	None
Floor		Metal			A	Y									
Piping		Metal			A	Y									
Wall		Fibrous Board, Laminate fiberboard wall			A	Y		100			%	S0022C	None Detected	N.D.	None

Legend:

Sample number	
S####	Sample collected.
V####	Material is visually identified to be identical to S####
V0000	Known non hazardous material.
V9000	Material is visually identified to contain hazardous material.
V9500	Material is presumed to contain hazardous material.

Units	
SF	Square feet
LF	Linear feet
EA	Each
%	Percentage

Other	
SVM	Suspect Visible Mould
A	Access
V	Visible
AP	Air Plenum
F	Friable material.
NF	Non Friable material.

Access	
A	Accessible to all building occupants
B	Accessible to maintenance and operations staff without a ladder
C	Accessible to maintenance and operations staff with a ladder. Also rarely entered, locked areas.
D	Not normally accessible or without demolition

Condition	
Good	No visible damage or deterioration
Fair	Minor, repairable damage, cracking or deterioration.
Poor	Irreparable damage or deterioration with exposed and missing material.

APPENDIX VIII

TEM Air Sample Lab Analysis Report

Air Monitoring for Asbestos by Transmission Electron Microscopy

CCGS Limnos
Vessel Number 328088
370 Dalhousie Street,
Amherstburg, Ontario

Prepared for:

Canadian Coast Guard
520 Exmouth Street
Sarnia, Ontario, N7T 8B1
Attention: Leslie Anne Veldman
Project Officer, Marine Engineering, Central and Artic

June 4, 2019

Pinchin File: 241027

Issued to:	**Canadian Coast Guard**
Contact:	**Leslie Anne Veldman**
	Project Officer, Marine
Issued on:	**Engineering, Central and Artic**
Pinchin File:	**June 4, 2019**
Issuing Office:	**241027**
Primary Pinchin	**Tilbury, ON**
Contact:	**Graham Rogers**
	519.682.4492 ext. 3302
	grogers@pinchin.com

Author: Dylan Melo, B.Sc.
Project Technologist
519.682.4492 ext. 3307
dmelo@pinchin.com

Reviewer: Tina Manning, CRSP, PMP, LEED AP
Operations Manager
519.682.4492 ext. 3301
tmanning@pinchin.com

TABLE OF CONTENTS

1.0 INTRODUCTION AND SCOPE 1

2.0 BACKGROUND: TYPICAL AIRBORNE ASBESTOS CONCENTRATIONS IN BUILDINGS AND OUTDOOR AIR 1

3.0 SAMPLING AND ANALYTICAL PROCEDURE 3

4.0 RESULTS AND DISCUSSION 4

5.0 TERMS AND LIMITATIONS 5

APPENDICES

APPENDIX I Analytical Results

1.0 INTRODUCTION AND SCOPE

Canadian Coast Guard (Client) retained Pinchin Ltd. (Pinchin) to measure airborne asbestos concentrations in the CCGS Limnos vessel docked at 370 Dalhousie Street, Amherstburg, Ontario.. The samples were analyzed using Transmission Electron Microscopy (TEM).

The following sections of this report describe the collection and analysis of three (3) air samples collected at locations selected by the Client and included the Focle Deck, MCR, and the Lower Deck Hallway (between the Mess and Old Incinerator Room). The results are discussed in relation to asbestos levels detected in ambient air.

2.0 BACKGROUND: TYPICAL AIRBORNE ASBESTOS CONCENTRATIONS IN BUILDINGS AND OUTDOOR AIR

In order to interpret the results of the air monitoring, it is necessary to discuss the general meaning and use of air sampling. No standards or guidelines for the assessment of asbestos exposures in occupied buildings by TEM have been published by any federal or provincial authority.

For control of airborne asbestos fibre concentrations in workplaces where asbestos is used in industrial operations, the Ontario Ministry of Labour (MOL) Regulation 278/05 applies a 40 hour per week exposure limit of 0.1 fibres/mL of air longer than 5 micrometres (fibres/mL >5 µm). This exposure limit applies to all types of asbestos fibres. The specified measurement technique is phase contrast optical microscopy (PCM). In this technique, the sample is examined under phase contrast illumination at a magnification of 450x and all particles that meet the following criteria are counted as fibres:

- Longer than 5 µm;
- Diameter of less than 3 µm;
- Length to width (aspect) ratio equal to or greater than 3:1.

The PCM method cannot distinguish asbestos fibres from other common fibrous particles such as cellulose, fibreglass, synthetic fibres or mineral wool. The resolution of the PCM microscope under these conditions is about 0.25 µm. Fibres thinner than this diameter will not be included in the count, regardless of their length. The detection limit varies with the sampling volume. However, the practical lower limit of quantitation in general use buildings is 0.01-0.03 fibres/mL, due to the common presence of other fibrous and dusts at these levels, and overloading of the filter by general building dust if a higher sampling volume was used. Given these limitations, this measurement technique is generally applied only where most airborne fibres are likely to be asbestos, such as in the asbestos industry or inside or immediately adjacent to or following asbestos abatement operations.

Existing legislation and environmental guidelines concerning permissible airborne asbestos fibre concentrations are expressed in terms of those fibres having lengths exceeding 5 micrometers (µm). There is a general, although not universal, agreement that shorter fibres pose a much lower hazard to health than long fibres. As stated by the Ontario Royal Commission on Asbestos[1] (Page 8 Chapter 1, Section B; Health Effects of Asbestos).

> "The asbestos fibres which are most likely to cause adverse health effects when inhaled are long and thin. "Length" and "diameter" are, of course, relative phenomena: fibres are measured in microns, one micron being one-millionth of a metre. The hazardous asbestos fibres are those which would be longer than 5, perhaps longer than 8 microns, and thinner than 1.5 or perhaps 0.25 microns."

When airborne asbestos fibres are present in the outdoor environment, they are generally too thin to be detected by phase contrast microscopy. In addition, in areas where asbestos is not the principal source of airborne dust, the concentration of airborne asbestos fibres is not necessarily correlated with the total fibre concentration. Particles or aggregates of particles can appear to be fibres when viewed under the conditions of the PCM examination. Conversely, particles, which appear in PCM to be non-fibrous particles, may actually be closely associated groups of fibres. In these circumstances it is not possible to predict the airborne asbestos level from the result of a measurement made by PCM.

Guidelines have not been established specifically for asbestos air quality in non-industrial, general occupancy buildings. The most thorough literature review of TEM air monitoring of buildings containing Asbestos Containing Material (ACM) was published in 1991 by the Health Effects Institute.[2] Based on the results of monitoring of 198 buildings containing ACM, their report stated that the concentration of airborne asbestos fibres (longer than 5 µm) ranged from 0.00004 to 0.00243 fibres/mL with a mean concentration of 0.00027 fibres/mL and a 95% percentile of 0.0014 fibres/mL. Based on this, it is clear that the existence of airborne fibres longer than 5 µm, even in a building with ACM, is relatively uncommon. It should be noted however that low levels of short (<5 µm) chrysotile fibres are commonly found in both outdoor air and in buildings with and without ACM. Although no study has provided an average for short fibres (as was provided by the HEI for fibres longer than 5 µm) it is quite common in Pinchin's experience to detect up to 3 fibres of short chrysotile asbestos in the TEM counting area of a typical air sample (with a volume collected in the order of 2000-2400 litres), equivalent to a concentration of about 0.01 fibres/mL. Amosite or crocidolite types of asbestos are very rarely detected in outdoor or building air.

1 Report of the Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario, Queens Printer for Ontario, Toronto 1984.
2 Asbestos in Public and Commercial Buildings: A Literature Review and Synthesis of Current Knowledge, Health Effects Institute-Asbestos Research, Cambridge, MA, 1991.

Based on all of the above studies and experience, Pinchin believes that it is reasonable to consider the asbestos concentration in a building atypical in any of the following circumstances:

- The average concentration of fibres >5µm exceeds 0.0014 fibres/mL (the 95th percentile of the HEI reported result); or
- The concentration of short chrysotile asbestos fibres exceeds 0.01 fibres/mL; or
- Asbestos fibres other than chrysotile are detected in the sample.

These criteria will be used to evaluate the air samples collected. It should be noted that even if concentrations exceed these criteria they do not automatically imply an actual health risk to occupants – merely an elevated level of airborne asbestos at the time of sampling.

3.0 SAMPLING AND ANALYTICAL PROCEDURE

The air sampling was conducted on May 13, 2019 at 9:00 am. The vessel occupants were present during the sampling period and the air handling systems remained operational.

The sampling locations were chosen by Canadian Coast Guard. The following presents the sampling details.

Sample Number	Location	Run Time (minutes)	Volume (L)
303848	N/A-Blank	N/A	N/A
303829	Aft Entrance Lower Deck	70	1056.3
303849	Focle Deck	70	1055.04
303841	MCR	70	1052.31

The samples were collected by drawing predetermined volumes of air through a mixed cellulose ester (MCE) filter having a pore size of 0.45 µm complete with backup pad, and an effective collection area of 380 mm^2. The filter is held in a 25 mm three-piece conductive cassette with a 50 mm extension cowl. Diaphragm vacuum pumps were used in sample collection. The pumps were calibrated using a primary standard before use. Sampling volumes were adjusted for the anticipated airborne fibre level, to give appropriate concentrations of fibres on the filter surface. Known flow rates were provided either by battery operated constant-flow personal air sampling pumps, or by AC-powered vacuum pumps and critical orifice controllers. The sampling equipment was flow calibrated with a DryCal Lite calibrator prior to sampling. Calibration was confirmed after sampling with either a DryCal or flowmeter. The pumps were generally collected open-faced at heights representative of occupant breathing zones (approximately 4.5 feet to 6 feet).

The samples were analyzed by Transmission Electron Microscopy (TEM) at Scientific Analytical Institute Inc. in Greensboro North Carolina according to the NIOSH 7402 method. This method is used to allow comparison with occupational exposure limits based on the PCM method, which has limited resolving power compared to the TEM methods and also counts all fibres as asbestos. First the sample is analysed by PCM to produce a fibre/cc count. Then another section of the sample is analysed by TEM, using methods similar to the Yamate method, except that only fibres that meet the NIOSH 7400 counting criteria (diameter >0.25 µm; aspect ratio 3:1 or higher; longer than 5µm) are counted. The % of asbestos fibres in the optically visible range is determined in the TEM. This percentage is then multiplied by the result obtained by the Phase Contrast Microscope (PCM) result to obtain a final result for asbestos in f/cc. This eliminates the overestimate caused by counting of non-asbestos fibres in the PCM method and eliminates asbestos fibres that would have been too thin to count by PCM.

The analytical results are provided in Appendix II of this report. The number of fibres detected (both Asbestos and Non-Asbestos Fibers) and the concentration in fibres/cc are reported in the analytical results. The results are reported in f/cc and are interpreted in exactly the same way as a normal PCM count. The only differences is that non-asbestos fibres in the optically visible range by PCM (diameter greater than 0.25µm, aspect ratio ≥3:1, longer than 5.0µm) have been eliminated from the reported result. The calculated concentration of asbestos present is dependent upon the number of structures counted, the area of the filter analyzed, the effective collection area of the filter and the volume of air drawn through the filter. If no asbestos structures are identified in the sample, the result is reported as being less than the Limit of Detection.

4.0 RESULTS AND DISCUSSION

The analytical results are attached and summarized below for clarity. The attached results are presented by # or asbestos fibres present and the concentration in fibres/cc.

The calculated concentration of asbestos present is dependent upon the number of grid openings analyzed, the number of structures counted, the area of the filter analyzed, the effective collection area of the filter and the volume of air drawn through the filter. If no asbestos structures are identified in the sample, the result is reported as being less than the Limit of Detection. Analytical results are attached and summarized below.

Date	Sample ID	Volume Sampled	Description of Sample	PCM Concentration (f/cc)	# of Asbestos Fibres	Concentration Asbestos Fibers/cc (fibres/mL),
May 13, 2019	303848	N/A	Blank	<0.02	None Detected	<0.00096
May 13, 2019	303829	1056.3	Occupied Aft Entrance Lower Deck	<0.02	None Detected	<0.00096
May 13, 2019	303849	1055.04	Occupied Focle Deck	<0.02	None Detected	<0.00096
May 13, 2019	303841	1052.31	Occupied MCR	<0.02	None Detected	<0.00096

The three (3) samples were collected in typical areas of the vessel during normal use and occupation. The analytical results presented in Appendix I show that all the samples contained no asbestos fibres. The calculated concentration is less than the analytical sensitivity of 0.00096 fibres/cc (or fibres/mL).

Based on the results of this monitoring, the airborne concentration of asbestos in the locations tested was not considered elevated and well below the Occupational Exposure Limit (OEL) of 0.1 fibres/mL.

5.0 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.

APPENDIX I

Analytical Results

Airborne Asbestos Analysis

By Transmission Electron Microscopy

NIOSH 7402

SAI Method T-SOP-006

Client:	Pinchin Ltd. 2470 Milltower Court Mississauga, ON L5N 7W5	**Attn:**	Graham Rogers D Melo T Deweerd	**Lab Order ID:** **Date Received:** **Date Reported:**	71913439 05/17/2019 05/22/2019
Project:	Canadian Coast Guard, Hazardous Materials Reassessment, 370			**Page:**	**1 of 1**

Sample ID	Description	Volume (L)	PCM Concentration (f/cc)*	# Non-Asbestos Fibers	# Asbestos Fibers	Concentration
Lab Sample ID	*Lab Notes*	*Area Analyzed (mm^2)*				Asbestos Fibers/cc
303848	Field Blank	0	N/A	0	None Detected	N/A
71913439TNI_1		0.380				
303829	Aft Entrance Lower Deck	1056	<0.02	0	None Detected	<0.00096
71913439TNI_2		0.380				
303849	Focle Deck	1055	<0.02	0	None Detected	<0.00096
71913439TNI_3		0.380				
303841	MCR	1052	<0.02	0	None Detected	<0.00096
71913439TNI_4		0.380				

*PCM data provided by client

Daniel Schwartz
Analyst

Lab Director

71913439

Version 1-15-2012

Client:	Pinchin Ltd.	***Instructions:**
Contact:	Graham Rogers	*Use Column "B" for your contact info*
Address:	2470 Milltower court	
Phone:	905-363-0678	*To See an Example Click the*
Fax:	905-363-0681	*bottom Example Tab.*
Email:	grogers@pinchin.com;dmelo@pinchin.com;tdeweerd@pinchin.com	
		Enter samples between "<<" and ">>"
Project:	Canadian Coast Guard, Hazardous I	***Begin Samples with a "<< "above the first sample and end with a ">>" below the last sample.***
Client Notes:	Canadian Coast Guard	*Only Enter your data on the first sheet "Sheet1"*
P.O. #.	241027	*Note: Data 1 and Data 2 are optional*
Date Submitted:	May 15/2019	*fields that do not show up on the official*
		report, however they will be included
Analysis:	TEM Niosh 7402 Method	*in the electronic data returned to you*
TurnAroundTime:	Regular B6	*to facilitate your reintegration of the report data.*

Invoice to:

Graham Rogers
ap@pinchin.com

Scientific Analytical Institute

4604 Dundas Dr.
Greensboro, NC 27407
Phone: 336.292.3888
Fax: 336.292.3313
Email: lab@sailab.com

Sample Number	Data 1 (Lab use only)	Sample Description	Data 2 (Lab use only)
<<			
303848		Field Blank	
303829		Aft Entrance Lower Deck	
303849		Focle Deck	
303841		MCR	
>>			

Accepted ☑

Rejected ☐

5.17
10:30A