Ruth Inch Memorial Pool Building Condition Assessment – Phase 1

Building Condition Assessment

Prepared for:
Grant White, Director Community Services
City of Yellowknife, NT
Yellowknife, NT

Prepared by:
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Stantec File: 144903431

Report Date January 22, 2024

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Prepared by 

Dennis Kefalas, P. Eng. (Project Manager)

Reviewed by 

Chris Edwards, C.E.T., A.Sc.T. (Architectural Lead)

Stantec

Executive Summary

The Ruth Inch Municipal Pool was constructed circa 1987 and consists of a recreational complex leisure pool facility in Yellowknife, NT. This building includes accessible amenities such as the pool beach access, a hot tub lift for all abilities and ages, a steam room, and a whirlpool. The facility also has a large outdoor deck with a BBQ and picnic tables that overlooks Frame Lake. The floor area of the building is approximately 1,319 m^2 (14,200 ft^2).

The existing pool services will be relocated to the new facility upon the completion of construction on the new facility. In order to make an informed decision about the current facilities re-use, The City of Yellowknife retained Stantec to provide a Building Condition Assessment (BCA) using a multi-disciplinary team. The BCA was divided into two phases. The first phase consisted of the structural condition assessment and the designated substance survey of the facility. The second phase will consist of architectural, mechanical, and electrical components of the BCA

The results of the structural assessment are very encouraging when it comes to the repurposing the Ruth Inch Memorial Pool. The foundation(s) and superstructure have held up over time and are in good condition and won't require a great deal of rehabilitation work to continue using the facility as something else. One very positive aspect of the foundation of the pool tank itself is that it is designed to hold the live loads associated with a pool. This bodes well in terms of repurposing the facility as a library should the City of Yellowknife decide that a library is the preferred option for repurposing.

The results of the hazardous building material assessment did not produce any surprises and is what would be expected for a facility built in the late 1980's. Regardless of what is done to the facility whether it is demolished or repurposed any hazardous materials will have to be dealt with in an appropriate manner. Essentially, there will be costs associated with either option.

In closing the results of both assessments have shown that the Ruth Inch Memorial Pool is a viable option for repurposing. Stantec is recommending proceeding with Phase 2 of the BCA and complete the architectural, electrical, and mechanical aspects of the BCA.

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1.0 OVERVIEW

The Ruth Inch Municipal Pool was constructed circa 1987 and consists of a recreational complex leisure pool facility in Yellowknife, NT. This building includes accessible amenities such as the pool beach access, a hot tub lift for all abilities and ages, a steam room, and a whirlpool. The facility also has a large outdoor deck with a BBQ and picnic tables that overlooks Frame Lake. The floor area of the building is approximately 1,319 m^2 (14,200 ft^2).

The existing pool services will be relocated to the new facility upon the completion of construction on the new facility. In order to make an informed decision about the current facilities re-use, The City of Yellowknife retained Stantec to provide Building Condition Assessment (BCA) using a multi-disciplinary team. The BCA was divided into two phases. The first phase consisted of the structural condition assessment and the designated substance survey of the facility. The second phase will consist of architectural, mechanical, and electrical components of the BCA. Before proceeding with phase two of the BCA, the first had to be completed to provide a level of comfort that the facility was a viable option for re-purposing. Overall Stantec will assess the existing facility condition and assess the current code upgrades required to facilitate how this building can be utilized in the future. Until such time, the City Yellowknife plans to develop a capital plan to manage and maintain the facility in a good and safe state of repair operationally.

The City of Yellowknife has provided record drawings, previous reports and any other relevant information that was available to assist in carrying out the BCA.

The BCA is intended to gather both qualitative and quantitative data on the building components with the primary objective to provide data on building components of high value relative to the facility and/or of high criticality to the facility's core function. Stantec is using a Uniformat standard for classifying building specifications, cost estimating and cost analysis, as a baseline to describe existing deficiencies and problem areas, and generally comment on the condition of each building element.

2.0 BUILDING CONDITION ASSESSMENT - PHASE 1 RESULTS

2.1 Structural Assessment Overview

Before completing the BCA in its entirety in terms of having all the major disciplines (mechanical, electrical, architectural, structural, and environmental) complete their respective assessments Stantec had to determine if the facility was a viable option for repurposing. As such the structural building condition assessment and the review of the Hazardous Building Materials Assessment conducted in 2022 had to be completed as part of Phase 1 of the BCA. Stantec has completed the structural assessment of the Ruth Inch Memorial Pool included in this summary report as an appendix.

The assessment scope of work was to:

- Investigate, evaluate, and identify functional deficiencies and deterrents of the existing building structural systems.
- Develop corrective measures to rectify physical and functional problems or deficiencies.

The on-site review was conducted on October 28, 2023, our review was visual in nature and no analysis or testing was done. A limited examination of available documentation was also carried out. The building was operational but not publicly occupied at the time of the visit. The building assessment was conducted by Structural Engineer Mike White, P.Eng., Structural Lead for Northern Canada

Our report is intended to provide the Client or their agent with a general description of the systems employed in the building and to comment on their general condition, which were observed during our field review, and suitability for continued use. Stantec has not performed any detailed calculations to confirm the adequacy of the systems but have based all evaluations on "rule-of-thumb" and engineering observations.

The review undertaken was generally of a visual nature only. Except where noted otherwise, no testing or dismantling of any covering was performed. Review was made on a random basis with no attempt to review or inspect every system or portion of the building. The intent of the review was to determine areas of visually obvious deterioration and need for repair and to determine in a general way the overall quality or sufficiency of the work but not to ascertain the quality or sufficiency of any specific aspect of the building.

Overall, the review went well, and the structure appears to be performing very well for the age of the building along with the high humidity environment. There were only two areas of concern noted during the review, the pool tank walls and the rear deck facing Frame Lake. The details or these areas are noted in the itemized section of this report.

It is our understanding that the City of Yellowknife may be considering utilizing this building as a public library once the new aquatic centre is complete. Although not the focus of this assessment, Stantec considers this to be a viable option with an appropriate layout that suits the structure capacities of the building.

The following is a brief summation of the observations from the structural assessment of the Ruth Inch Memorial Pool.

A summary of the structural engineering assessment observations is presented in the following table. The complete assessment is included in Appendix A

Element	Observations	Recommendations
Substructure Foundations	All visible foundation elements bearing on the bedrock appeared to be in very good condition with no signs of failure or damage.	No recommendations.
	All visible columns supporting the main floor slab appeared to be in good condition. It was noted that many of the column tops showed minor signs of spalling and moderate-to-severe honeycombing. The honeycombing would be a result of construction defects and does not seem to be impacting the performance of the member.	No recommendations.
	All visible columns and piers supporting the rear deck (facing Frame Lake) appeared to be in good condition. It was noted that many of the columns are showing signs of moderate-to-severe rust.	It is recommended that the exterior steel columns be stripped of existing paint/finish and refinished with a polymer or epoxy-based coating.
Substructure Slabs-on-Grade	Slab-on-grade floors are present in the basement level in the mechanical room, a few storage areas, and around the pool tank. Overall, the slab seemed to be in good condition. There were a few locations where large cracks have formed likely from some slab movement over the life of the building	It is recommended that these large cracks be filled with a cement-polymer grout patch/filler product.

Element	Observations	Recommendations
Shell Superstructure Floor Construction	Much of the rear deck is showing significant signs of corrosion. From the underside of the deck, it appears that the metal deck is composite with the concrete topping which means it acts as the reinforcement. A compromised steel deck significantly impacts the capacity of the overall slab. Also, the steel beams supporting the rear deck are significantly corroded. From what could be observed from below, most of the main floor structure, including supporting columns, appeared to be in very good condition. The floor slab and beams show no signs of distress or failure with no significant cracking or spalling. One area of minor concern is the discoloration of the slab near the pool tank. This is limited to within one metre (or less) of the tank-to-wall interface. Though it is discolored, no spalling or exposed reinforcement was observed.	It is recommended that much (if not all) of the rear deck be demolished and replaced with if still needed. The materials for the new deck will depend on the future use of the building. No recommendations.
Shell Superstructure Roof Construction	All visible roof members, including supporting columns and roof decking, appeared to be in very good condition. Given the age of the structure, the glulam construction, and the high humidity it is quite surprising to see this level of structural performance. No splitting or delamination was noted in any of the glulam members and the steel connections we most clean and free of corrosion.	It is suggested that these areas be cleaned and refinished. Refer to the upcoming Architectural assessment for final recommendations.

Element	Observations	Recommendations
	One cosmetic item to note was some staining on the a few of the glulam members. This is likely due to past water infiltration from possible failure of the architecture roof assembly. The structural integrity of these members does not appear to be affected at this time.	
Special Construction & Demolition Special Features	Many areas around the pool tank showed significant signs of spalling and reinforcement corrosion likely caused by heavy chlorine (chloride) infiltration from the wet side. In some cases, the spalling was significant enough that the reinforcement has become exposed. The final recommendations for this issue will ultimately depend on the future use of the building. It is unlikely that the existing pool tank will continue to serve as a tank.	We recommend that the any loose concrete be removed and scraped down to solid material. All corroded/exposed reinforcement should also be cleaned and then the wall patched with a cement-polymer/epoxy grout patch/filler product. Note: If it is not possible to clean the reinforcement, a surface mount reinforcement plan will need to be considered. This will require a specific engineered design.

2.2 Hazardous Building Materials Assessment Overview

The original scope of this project included conducting a designated substance survey of the Ruth Inch Memorial Pool. During discussion with our hazardous material environmental assessment team, it is discovered that a recent Hazardous Materials Assessment had just be recently completed for the Ruth Inch. While the intent of the most recent report differs slightly from what was included in the scope for this project the results provide the necessary information needed to determine if the facility is a viable option for repurposing. To reduce overall project costs Stantec will be using the results of most recent report as part of the evaluation and BCA.

In 2022 Stantec was commissioned by KPMG LLP on behalf of the City of Yellowknife to conduct a hazardous building materials assessment of the Ruth Inch Memorial Pool.

The purpose of the assessment was to check for potential hazardous building materials that may require special management practices in accordance with applicable territorial regulations, during continued operations and maintenance, as well as to support the City of Yellowknife's planned implementation of a new accounting standard on asset retirement obligations.

The work was carried out in accordance with the requirements of the current versions of the following:

- Northwest Territories Occupational Health and Safety Regulations (NWT OHS Reg.)
- Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut (WSCC) document *Code of Practice for Asbestos Abatement* (Asbestos CoP).

The hazardous building materials considered during this assessment included the following:

- asbestos-containing materials (ACMs)
- lead including lead-containing paints (LCPs)
- electrical equipment with polychlorinated biphenyls (PCBs)
- materials impacted by mould or exhibiting evidence of moisture intrusion conducive to mould growth
- electrical equipment with elemental mercury
- equipment with ozone-depleting substances (ODSs)
- building materials that may contain silica

The site work was conducted by Ms. Sabrina Guglielmi on May 18, 2022.

Based on Stantec's visual assessment and the laboratory analyses performed on the samples collected, limited hazardous building materials were identified to be present.

A summary of our findings of the hazardous building materials is presented in following table. Recommendations pertaining to the handling, removal, transportation, and disposal of identified hazardous building materials are provided in the body of Hazardous Building Materials Assessment Report included in Appendix B.

Hazardous Building Material	Summary of Findings
Asbestos	ACMs were not identified through this assessment. Vermiculite insulation, a potential asbestos-containing material, may be present in masonry block walls throughout (destructive testing required to confirm presence/absence). Presumed asbestos-containing materials (PACMs) were observed to be present in the form of: • products associated with ceramic tiles (e.g., grout and adhesive) in various locations • brick mortar These materials were observed to be in good condition. These materials were not sampled to preserve their integrity and due to height restrictions. As these materials are known to have been manufactured with asbestos, they should be presumed to be asbestos containing unless proven otherwise by laboratory analysis.
Lead	The following LCPs additional were identified through this assessment: • green paint applied to metal doors throughout • red paint applied to metal handrails and trim throughout exterior o localized damage observed (paint chipping and flaking on sundeck handrails) Unless otherwise noted above, identified LCPs were observed to be in good condition. Lead may also be present in the following materials: • lead-acid batteries used in emergency lighting • older electrical wiring materials and sheathing • solder used on domestic water lines • solder used in bell fittings for cast iron pipes and electrical equipment • ceramic tile glaze • vent and pipe flashings
Polychlorinated biphenyls (PCBs)	PCBs may be present in the fluorescent light ballasts of the approximately 100 light fixtures observed. As the ballasts were energized, they could not be inspected at the time of the assessment for health and safety reasons.

Hazardous Building Material	Summary of Findings
Mould	Observations indicating conditions conducive to mould growth included the following: • moisture-stained ceiling tiles, lower-level staff room
Mercury	Mercury vapour is present in the light tubes/bulbs in the approximately 100 fluorescent light fixtures observed throughout.
Ozone-depleting substance (ODS)	Building related cooling and refrigeration equipment suspected to be ODS-containing was not observed.

Silica	Silica is expected to be present in the following, which were observed in various locations throughout:
	• cement products such as:
	  • concrete—foundations, floors, walls
	  • brick/masonry units and associated grout and mortar
	  • stone/ceramic floor tiles and associated grouts and mortars
	• drywall and associated wall/ceiling finish materials
	• suspended ceiling tiles

2.3 Conclusions

The results of the structural assessment are very encouraging when it comes to the repurposing the Ruth Inch Memorial Pool. The foundation(s) and superstructure have held up over time and are in good condition and won't require a great deal of rehabilitation work to continue using the facility as something else. One very positive aspect of the foundation of the pool tank itself is that it is designed to hold the live loads associated with a pool. This bodes well in terms of repurposing the facility as a library should the City of Yellowknife decide that a library is the preferred option for repurposing.

The results of the hazardous building material assessment did not produce any surprises and is what would be expected for a facility built in the late 1980's. Regardless of what is done to the facility whether it is demolished or repurposed any hazardous materials will have to be dealt with in an appropriate manner. Essentially, there will be costs associated with either option.

In closing the results of both assessments have shown that the Ruth Inch Memorial Pool is a viable option for repurposing. Stantec is recommending proceeding with Phase 2 of the BCA and complete the architectural, electrical, and mechanical aspects of the BCA.

APPENDICES

Appendix A RUTH INCH MEMORIAL BUILDING CONDITION ASSESSMENT – STRUCTURAL ASSESSMENT

Ruth Inch Memorial Building Condition Assessment - Structural Assessment

Technical Services Assessment Report

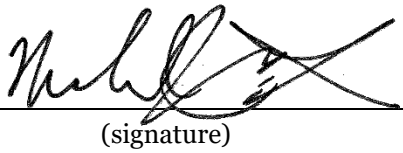
Prepared for:
The City of Yellowknife
4807 - 52 Street
Yellowknife, NT, Canada

Prepared by:
Stantec Architecture Ltd.
Second Floor, 4910 53rd Street
Yellowknife, NT, Canada

January 16, 2024

Sign-off Sheet

This document entitled Ruth Inch Memorial Building Condition Assessment - Structural Assessment was prepared by Stantec Architecture Ltd. for the account of the City of Yellowknife. The material in it reflects Stantec's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Stantec Architecture Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Prepared by 
(signature)

Michael White, P.Eng. – Senior Associate

Reviewed by 
(signature)

Dennis Kefalas, P.Eng. – Project Manager

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January 27, 2024

Executive Summary

The Ruth Inch Memorial Pool was visited by Mike White, P. Eng. from Stantec on October 28, 2023, to assess the state of the building's accessible structural component. Stantec personnel was accompanied my pool employee(s) throughout the site visit.

The review started in the crawlspace and proceeded to the basement, areas around the tank walls and then onto the public areas of the main floor. Office and washroom/change room areas were also reviewed but no structure was visible.

Overall, the review went well, and the structure appears to be performing very well for the age of the building along with the high humidity environment. There were only two areas of concern noted during the review, the pool tank walls and the rear deck facing Frame Lake. The details or these areas are noted in the itemized section of this report.

It is our understanding that the City of Yellowknife may be considering utilizing this building as a public library once the new aquatic centre is complete. Although not the focus of this assessment, Stantec considers this to be a viable option with an appropriate layout that suits the structure capacities of the building.

January 27, 2024

1.0 Overview

1.1 TERMS OF ENGAGEMENT

This report has been prepared to complete an assessment of the Ruth Inch Memorial Pool. The assessment scope of work was to:

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- Develop corrective measures to rectify physical and functional problems or deficiencies.

The on-site review was conducted on October 28, 2023, our review was visual in nature and no analysis or testing was done. A limited examination of available documentation was also carried out. The building was operational but not publicly occupied at the time of the visit. The building assessment was conducted by Structural Engineer Mike White, P.Eng., Structural Lead for Northern Canada

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Reports prepared by Stantec as part of this Agreement are exclusively for the use and benefit of the Client and are not for the use or benefit or, nor may be relied upon by, any other person or entity. The contents of these reports may not be quoted in whole or in part or distributed to any person or entity other than to the Client and/or their designate.

1.2 PROJECT PERSONNEL

The following Stantec Architecture Ltd. personnel prepared this report and completed the systems assessment:

- Project Manager ..... Dennis Kefalas, P.Eng.
- Structural Assessment ..... Michael White, P.Eng., Structural Lead (Northern Canada)
- Peer Review ..... Dennis Kefalas, P.Eng.

2.0 Background and History

The Ruth Inch Municipal Pool was constructed circa 1987 and consists of a recreational complex leisure pool facility in Yellowknife, NT. This building includes accessible amenities such as the pool beach access, a hot tub lift for all abilities and ages, a steam room, and a whirlpool. The facility also has a large outdoor deck with a BBQ and picnic tables that overlooks Frame Lake. The floor area of the building is approximately 1,319 m^2 (14,200 ft^2).

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3.0 Structural Systems

3.1 FOUNDATION

- The building is directly supported by Canadian Shield bedrock.
- Concrete piers and walls cast to bedrock and supporting the basement and superstructure.

3.2 BASEMENT / CRAWLSPACE / POOL TANK

- Concrete piers and walls.
- Structural slab-on-grade in occupiable areas of the basement. The crawlspace floor is unfinished exposed bedrock and sand.
- Structural concrete floor in the pool tank area.

3.3 MAIN FLOOR

- Concrete piers and walls.
- Concrete beams supported by piers and walls.
- Suspended concrete main floor supported by the perimeter concrete walls, the pool tank walls, and the integrated (monolithic) concrete beams elsewhere.

3.4 ROOF

- Glulam columns supported by the lower concrete members.
- Glulam beams and purlins supported by the glulam columns.
- Heavy timber plank roof decking supported by the purlins.

4.0 Site Observations and Recommendations

4.1 OVERVIEW

The following evaluation of the Ruth Inch Memorial Pool is based on the UniFormat System of Building Management. This system provides a consistent reference when analyzing or discussing building and services components specific to the structural components. It is a hieratically classification system that subdivides major components down to elemental items.

The existing equipment and systems have been assessed for remaining service life, required action and general overall rating. The following describes the terminology used and explanations of the rating system.

4.2 DEFINITIONS

4.2.1 Remaining Service Life

Refers to the remaining cost-effective service life of the system or component being considered. There are eight remaining service life ratings in the report:
Over 15 years – means that under normal operating conditions and receiving proper maintenance, the system or component is expected to remain economically in service exceeding 15 years. Often the system or component is in new or like new condition.
10 to 15 years – means that under normal conditions and receiving proper maintenance, the system or component is expected to remain in service for 10 to 15 years.
5 to 10 years – means the end of the effective economic service life of this system or component has been reached. Plans to replace or renovate the system or component should proceed.
Less than 5 years – means the system or component is still in service, but will reach the end of its effective economic service life in the immediate future. The system or component should be replaced or serviced in the near future.
Zero years – means the system or component is still in service; however, the end of its effective economic service life has been reached and could fail at any time.
Not Operational – means the system or component is not in service as intended. One or more systems or components may have failed as a result of reaching the end of its expected service life, or due to maintenance or operational circumstances.
Not Determined – means that sufficient information could not be gathered on the system or component to assign a remaining service life.
Varies See Detail – is used to describe a system consisting of many subsystems and/or components, where the remaining service life of the subsystems and/or components may differ, and are described separately.

4.2.2 Recommended Action Priority

Refers to the urgency of the recommended action. The urgency reflects the importance of the recommended action to the safety, cost efficient operation of the conservation of the element's service life.

Code related items are identified in the course of examining building technology, but should not be considered an exhaustive analysis of current code compliance. There are seven levels of action used in the report:
Mandatory – means an action, which is a legal obligation arising from the requirement of a code, regulation or referenced standard, and involves life safety concerns. This action must be addressed immediately.
High priority – means an action, which is a legal obligation arising from requirement of a code or regulation, and must be addressed at the first available opportunity. There may not be a life safety concern.
Code Upgrade – means a building system or component that does not meet current code requirements, regulations or standards and is, therefore, a legal obligation. It must be addressed as part of any contemplated building additions and/or renovations.
Requirement – means the system or parts thereof requires replacement.
Desirable – means an action which when taken will improve substantially the safety, cost efficient operation, or extended the service life of the building system or component.
Suggestion – means an action that will have some benefit to the operation or longevity of the building system or component and is a discretionary item.
None – means there is no recommended action.

4.2.3 Performance Rating

Refers to the degree to which the identified status or condition of the element conforms to technical performance requirements or standards called for in codes, standards and guidelines for design and construction quality, and current operating and maintenance standards. There are six performance ratings used in the report:
Very Good – means the elements performance meets and exceeds specified quality standard.
Good – means the element conforms to the specified quality standard.
Satisfactory – means the element generally conforms to the specified quality standard with some shortcomings.
Unsatisfactory – means the element fails to meet the specified quality standard.
Not Determined – means that sufficient information could not be gathered on the system or component to assign a performance rating.
Varies See Detail – is used to describe a system consisting of many subsystems and/or components, where the performance rating of the subsystems and/or components may differ, and are described separately.

SITE OBSERVATIONS	RECOMMENDATIONS

A – SUBSTRUCTURE

This system includes all work below the lowest floor construction (usually slab-on-grade) and the enclosing horizontal and vertical elements required to form a basement, together with the necessary mass excavation and backfill.

01

A10 FOUNDATIONS

Remaining Service Life	Varies See Details
Action Priority	Varies See Details
Rating	Varies See Details

See detailed records.

See applicable detail records.

02

A1010 Standard Foundations

Remaining Service Life	Over 15 Years
Action Priority	None
Rating	Very Good

Crawlspace Foundation Piers

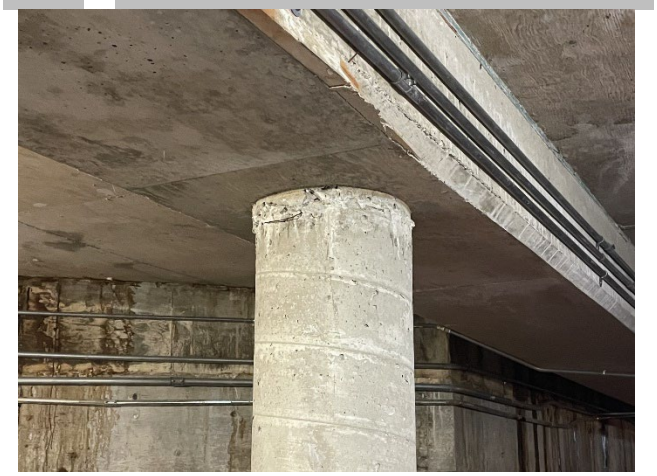
All visible foundation elements bearing on the bedrock appeared to be in very good condition with no signs of failure or damage.

No recommendations.

03

A1010 Standard Foundations

Remaining Service Life	Over 15 Years
Action Priority	None
Rating	Satisfactory



Crawlspace Columns

All visible columns supporting the main floor slab appeared to be in good condition. It was noted that many of the column tops showed minor signs of spalling and moderate-to-severe honeycombing. The honeycombing would be a result of construction defects and does not seem to be impacting the performance of the member.

No recommendations.

SITE OBSERVATIONS

04 **A1010 Standard Foundations**

Rear Deck Foundation Piers and Columns

RECOMMENDATIONS

Remaining Service Life	10 - 15 Years
Action Priority Rating	Requirement Satisfactory

All visible columns and piers supporting the rear deck (facing Frame Lake) appeared to be in good condition. It was noted that many of the columns are showing signs of moderate-to-severe rust.
Also See Section B1010.

It is recommended that the exterior steel columns be stripped of existing paint/finish and refinished with a polymer or epoxy-based coating.

05 **A40 SLABS-ON-GRADE**

Basement Floor Slab Around Base of Pool Tanks

Remaining Service Life	Over 15 Years
Action Priority Rating	Suggestion Satisfactory

Slab-on-grade floors are present in the basement level in the mechanical room, a few storage areas, and around the pool tank. Overall, the slab seemed to be in good condition. There were a few locations where large cracks have formed likely from some slab movement over the life of the building.

It is recommended that these large cracks be filled with a cement-polymer grout patch/filler product.

SITE OBSERVATIONS	RECOMMENDATIONS

B – SHELL

This system includes all structural slabs, and decks and supports within basements and above grade. Note that the structural work will include both horizontal items (slabs, decks, etc.) and vertical structural components (columns and interior structural walls). Exterior load bearing walls are not included in this system but in System B2010, Exterior Walls.

06	B10 SUPER STRUCTURE

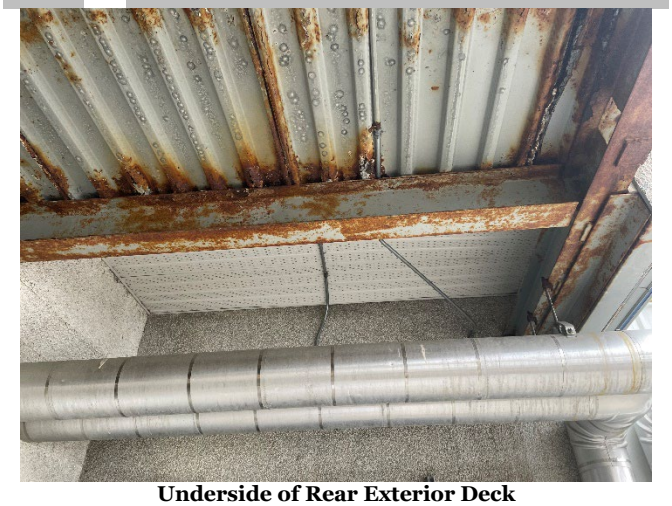
Remaining Service Life	Varies See Details
Action Priority	Varies See Details
Rating	Varies See Details

See detailed records.

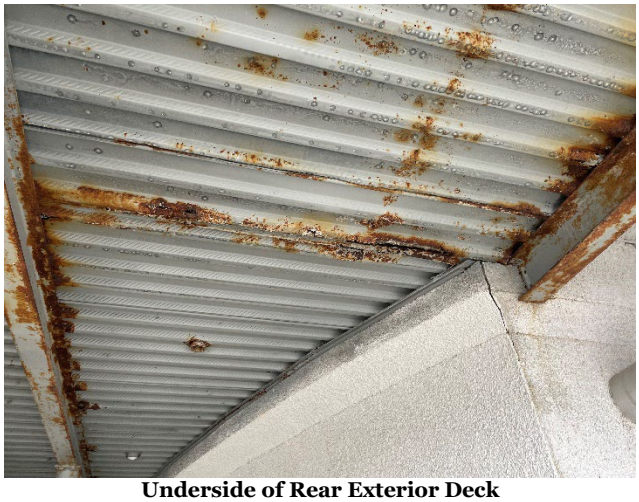
See applicable detail records.

07	B1010 Floor Construction

Remaining Service Life	Less than 5 Years
Action Priority	Mandatory
Rating	Unsatisfactory



Underside of Rear Exterior Deck



Underside of Rear Exterior Deck

Much of the rear deck is showing significant signs of corrosion. From the underside of the deck, it appears that the metal deck is composite with the concrete topping which means it acts as the reinforcement. A compromised steel deck significantly impacts the capacity of the overall slab.

Also, the steel beams supporting the rear deck are significantly corroded.

It is assumed that the noted corrosion is a result of chlorine (chloride) attack from above as people have left the pool to enter the deck area. Given this assumption, it is recommended that much (if not all) of the rear deck be demolished and replaced with if still needed. The materials for the new deck will depend on the future use of the building.

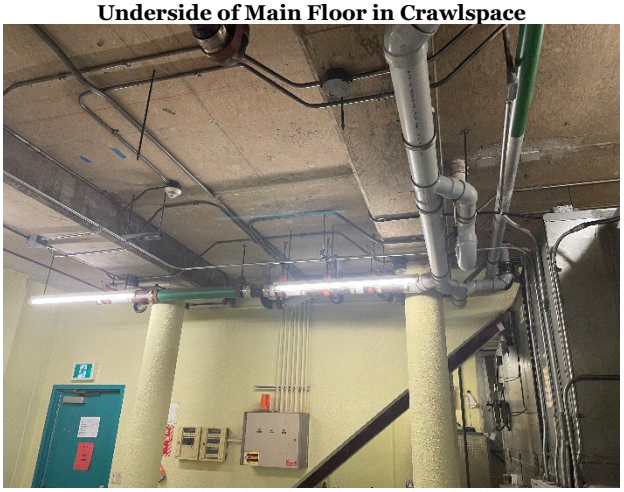
The extent of the demolition a new build will require further investigation and alignment with the client needs.

08	B1010 Floor Construction

Remaining Service Life	Over 15 Years

SITE OBSERVATIONS

Underside of Main Floor in Crawlspace



Underside of Main Floor in Mechanical Room

RECOMMENDATIONS

Action Priority	None
Rating	Satisfactory

From what could be observed from below, most of the main floor structure, including supporting columns, appeared to be in very good condition. The floor slab and beams show no signed of distress or failure with no significant cracking or spalling.

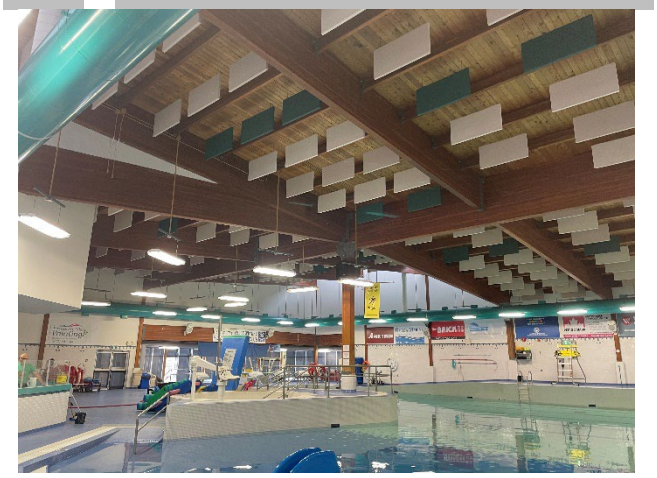
One area of minor concern is the discoloration of the slab near the pool tank. This is limited to within one metre (or less) of the tank-to-wall interface. Though it is discolored, no spalling or exposed reinforcement was observed.

No recommendations.

SITE OBSERVATIONS

09

B1020 Roof Construction



Roof Over Pool Tank

Roof Over Pool Tank

RECOMMENDATIONS

Remaining Service Life	Over 15 Years
Action Priority	Suggestion
Rating	Very Good

All visible roof members, including supporting columns and roof decking, appeared to be in very good condition. Given the age of the structure, the glulam construction, and the high humidity it is quite surprising to see this level of structural performance. No splitting or delamination was noted in any of the glulam members and the steel connections we most clean and free of corrosion.

One cosmetic item to note was some staining on the a few of the glulam members. This is likely due to past water infiltration from possible failure of the architecture roof assembly. The structural integrity of these members does not appear to be affected at this time.

It is suggested that these areas be cleaned and refinished. Refer to the upcoming Architectural assessment for final recommendations.

SITE OBSERVATIONS	RECOMMENDATIONS

F – SPECIAL CONSTRUCTION & DEMOLITION

Special construction includes air-supported structures; pre-engineered structures; special purpose rooms; sound, vibration, and seismic construction; radiation protection; special security systems; aquatic facilities; ice rinks, site constructed incinerators; kennels and animal shelters; liquid and gas storage tanks; recording instrumentation; and building automation systems. Selective building demolition includes demolition of existing buildings, and site demolition.

10 **F10 SPECIAL CONSTRUCTION**

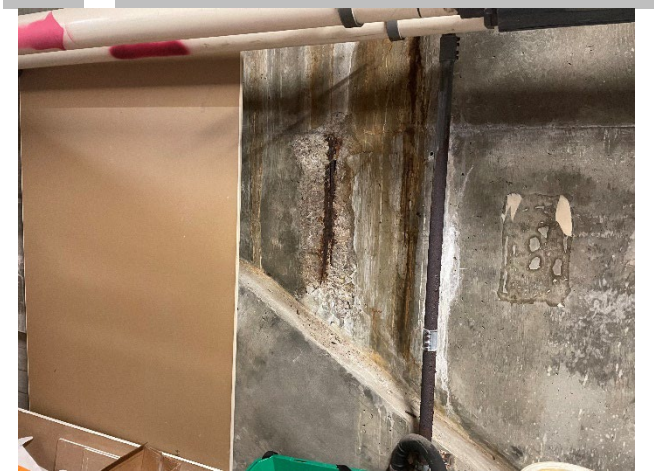
Remaining Service Life	Varies See Details
Action Priority	Varies See Details
Rating	Varies See Details

See detailed records.

See applicable detail records.

11 **F1020 Special Structures**

Remaining Service Life	Less than 5 Years
Action Priority	Mandatory
Rating	Unsatisfactory



Pool Tank Wall – Exposed Reinforcement

Pool Tank Wall – Spalling and Corrosion

Many areas around the pool tank showed significant signs of spalling and reinforcement corrosion likely caused by heavy chlorine (chloride) infiltration from the wet side. In some cases, the spalling was significant enough that the reinforcement has become exposed.

The final recommendations for this issue will ultimately depend on the future use of the building. It is unlikely that the existing pool tank will continue to serve as a tank.

There for, as a minimum, we recommend that the any loose concrete be removed and scaped down to solid material. All corroded/exposed reinforcement should also be cleaned and then the wall patched with a cement-polymer/epoxy grout patch/filler product.

Note: If it is not possible to clean the reinforcement, a surface mount reinforcement plan will need to be considered. This will require a specific engineered design.

Appendix B HAZARDOUS BUILDING MATERIALS ASSESSMENT

Hazardous Building Materials Assessment

Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

June 24, 2022

Prepared for:

KPMG LLP
150 Elgin Street, Suite 1800
Ottawa, ON, K2P 2P8

Prepared by:

Stantec Consulting Ltd.
500 – 4515 Central Blvd.
Burnaby, BC V5H 0C6

Project Number: 123222072

Limitations and Sign-off

This document entitled Hazardous Building Materials Assessment was prepared by Stantec Consulting Ltd. ("Stantec") for the account of KPMG (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Personnel conducting site work and documentation reviews for this project, as indicated below, have appropriate knowledge and experience in the management and control of asbestos hazards to be considered "qualified persons" by the most recent version of the Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut document entitled Asbestos Abatement Code of Practice, as it pertains to the provision of consultation in relation to asbestos in buildings.

Prepared by Sabrina Guglielmi
(signature)

Sabrina Guglielmi, B.Sc., Cert.GIS

Reviewed by Keith Irwin
(signature)

Keith Irwin, Dipl. Tech.

Approved by
(signature)

Sean Brigden, B.Sc., P.B.Dipl., CRISP

Executive Summary

Stantec Consulting Ltd. (Stantec) was commissioned by KPMG LLP (the Client) on behalf of the City of Yellowknife to conduct a hazardous building materials assessment of the Ruth Inch Memorial Pool located at 6002 Franklin Ave, Yellowknife, Northwest Territories (subject building). The subject building was reportedly constructed in 1988.

The purpose of the assessment was to check for potential hazardous building materials that may require special management practices in accordance with applicable territorial regulations, during continued operations and maintenance, as well as to support the City of Yellowknife's planned implementation of a new accounting standard on asset retirement obligations.

The work was carried out in accordance with the requirements of the current versions of the following:

- Northwest Territories Occupational Health and Safety Regulations (NWT OHS Reg.)
- Workers' Safety and Compensation Commission of the Northwest Territories and Nunavut (WSCC) document *Code of Practice for Asbestos Abatement* (Asbestos CoP).

The hazardous building materials considered during this assessment included the following:

- asbestos-containing materials (ACMs)
- lead including lead-containing paints (LCPs)
- electrical equipment with polychlorinated biphenyls (PCBs)
- materials impacted by mould or exhibiting evidence of moisture intrusion conducive to mould growth
- electrical equipment with elemental mercury
- equipment with ozone-depleting substances (ODSs)
- building materials that may contain silica

Based on Stantec's visual assessment and the laboratory analyses performed on the samples collected, limited hazardous building materials were identified to be present.

A summary of our findings is presented in Table ES.1, below. Recommendations pertaining to the handling, removal, transportation and disposal of identified hazardous building materials are provided in the body of this report.

Table ES.1 Summary of Findings

Hazardous Building Material	Summary of Findings
Asbestos	ACMs were not identified through this assessment. Vermiculite insulation, a potential asbestos-containing material, may be present in masonry block walls throughout (destructive testing required to confirm presence/absence). Presumed asbestos-containing materials (PACMs) were observed to be present in the form of: • products associated with ceramic tiles (e.g., grout and adhesive) in various locations • brick mortar These materials were observed to be in good condition. These materials were not sampled to preserve their integrity and due to height restrictions. As these materials are known to have been manufactured with asbestos, they should be presumed to be asbestos-containing unless proven otherwise by laboratory analysis.
Lead	The following LCPs additional were identified through this assessment: • green paint applied to metal doors throughout • red paint applied to metal handrails and trim throughout exterior – localized damage observed (paint chipping and flaking on sundeck handrails) Unless otherwise noted above, identified LCPs were observed to be in good condition Lead may also be present in the following materials: • lead-acid batteries used in emergency lighting • older electrical wiring materials and sheathing • solder used on domestic water lines • solder used in bell fittings for cast iron pipes and electrical equipment • ceramic tile glaze • vent and pipe flashings
Polychlorinated biphenyls (PCBs)	PCBs may be present in the fluorescent light ballasts of the approximately 100 light fixtures observed. As the ballasts were energized, they could not be inspected at the time of the assessment for health and safety reasons.
Mould	Observations indicating conditions conducive to mould growth included the following: • moisture-stained ceiling tiles, lower-level staff room
Mercury	Mercury vapour is present in the light tubes/bulbs in the approximately 100 fluorescent light fixtures observed throughout.
Ozone-depleting substance (ODS)	Building related cooling and refrigeration equipment suspected to be ODS-containing was not observed.

Table ES.1 Summary of Findings

Hazardous Building Material	Summary of Findings
Silica	Silica is expected to be present in the following, which were observed in various locations throughout: • cement products such as: – concrete—foundations, floors, walls – brick/masonry units and associated grout and mortar – stone/ceramic floor tiles and associated grouts and mortars • drywall and associated wall/ceiling finish materials • suspended ceiling tiles

The statements made in this Executive Summary text are subject to the same limitations included in this report and are to be read in conjunction with the remainder of this report.

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Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ACM	asbestos-containing material
AIHA	American Industrial Hygiene Association
AMP	Asbestos Management Plan
CEPA	*Canadian Environmental Protection Act*
CFC	chlorofluorocarbons
CMHC	Canada Mortgage and Housing Corporation
EACO	Environmental Abatement Council of Ontario
ELLAP	Environmental Lead Laboratory Approval Program
EMSL	EMSL Canada Inc.
HUD	Housing and Urban Development
HVAC	heating, ventilation and air conditioning
LCP	lead-containing paint
NVLAP	National Voluntary Laboratory Accreditation Program
NWT	Northwest Territories
ODS	ozone-depleting substance
OEL	occupational exposure limit
OHS	Occupational Health and Safety
PACM	presumed asbestos-containing material
PCB	polychlorinated biphenyl
USEPA	United States Environmental Protection Agency
WSCC	Workers' Safety and Compensation Commission

1.0 INTRODUCTION

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- electrical equipment with polychlorinated biphenyls (PCBs)
- materials impacted by mould or exhibiting evidence of moisture intrusion conducive to mould growth
- electrical equipment with elemental mercury
- equipment with ozone-depleting substances (ODSs)
- building materials that may contain silica

The site work was conducted by Ms. Sabrina Guglielmi on May 18, 2022.

1.1 UNDERSTANDING OF THE PROJECT

Stantec understands that the information pertaining to the identity, location and approximate extent of hazardous building materials (if any) within the subject building is not on-file, and that the City of Yellowknife is implementing a new accounting standard on asset retirement obligations. As part of this process, the City of Yellowknife would like to consider the risk of asbestos, lead, and other hazardous building materials that they are legally obligated to remove at the end of the subject building's life, such that they can budget appropriately for the costs associated with such removal.

Additionally, the City of Yellowknife can use the information obtained through this assessment to meet the requirements of the current version of the NWT OHS Reg. and the Asbestos CoP as they pertain to managing hazardous building materials in the workplace.

2.0 SCOPE

The planned scope of work for this assessment included the following:

- Review of existing information, including site drawings, and discussions with site personnel, where available.
- Visual assessment of readily accessible areas for the presence of suspected hazardous building materials.
- Collection of representative bulk samples from building materials suspected to contain asbestos fibres.
- Collection of paint chip samples for the determination of the lead content in paint finishes.
- Submission of samples collected for laboratory analysis.
- Evaluation and interpretation of field findings and sample analytical results to develop conclusions and recommendations pertaining to hazardous building materials identified.

2.1 LIMITATIONS

This report has been prepared for general information purposes associated with continued operations and maintenance of the subject building. This report does not necessarily constitute a pre-renovation or pre-demolition assessment, which can involve destructive removal of building finishes to observed concealed conditions. Prior to any renovation or demolition work within the subject building, this report must be reviewed by an appropriately qualified professional (with education and experience associated with the management of hazardous building materials) to determine what, if any, additional assessment is necessary.

In preparation of this report, Stantec used professional judgment based on experience. The work was conducted in accordance with generally accepted professional standards. Stantec relied on information gathered during the site investigation and laboratory analytical reports.

This report reflects the observations made within accessible and accessed areas of the subject building, and the results of analyses performed on the specific material sampled during the assessment sampled by Stantec. Analytical results reflect the sampled materials at the specific sample locations.

This report has been prepared for the exclusive use of the Client for the purpose of assessing general conditions in the subject building. Any use that a third party makes of this report, or reliance on, or decisions to be made on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

2.1.1 Physical and Sampling Limitations

Sampling was conducted pertaining to suspected ACMs and suspected LCPs only. The assessment for the presence of other hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible spaces only.

Concealed spaces were inspected via existing access panels, where present. Interior and exterior finishes, solid ceilings, walls, flooring and structural elements were not removed to access concealed areas.

Due to limitations on the agreed to scope of work for this project as well as physical limitations in accessing concealed areas and limitations associated with working in occupied/operational spaces, there are specific limitations to the information that can be provided regarding each hazardous building material considered in this assessment, as summarized below.

- Building materials that may be present and that may contain asbestos but were not confirmed as present and/or not accessible for sampling include, but are not limited to the following:
  - roofing materials (e.g. sealants, mastics, caulking, underlayment and/or other concealed layers, if present, on or beneath exposed metal panel roofing)
  - sub-grade materials (e.g., asbestos cement drainage pipe)
  - flooring material concealed beneath ceramic tile or concealed beneath existing sub-floors
  - insulation material present inside walls (e.g., suspected asbestos-containing vermiculite insulation inside concrete block and/or brick walls)
  - wall or ceiling finish materials concealed behind new and/or additional walls, ceilings, or layers of wall/ceiling materials
  - interior components of heating, ventilation and air conditioning (HVAC) units and associated ducting (e.g., woven tape inside duct connection joints, inner linings and/or insulation on the interior side of ducts)
  - mechanical (e.g., piping and ducting) insulation within wall cavities, or other concealed spaces
  - insulation materials inside fire-rated doors
  - heat protection materials inside mechanical installations and light fixtures
- Samples of paint applications suspected to contain lead were collected from surfaces of major paint applications where visually different paint colours and/or types were identified. Although the surfaces where samples were collected may be covered with more than one coat of paint, the paint samples are described by the surface (visible) colour only. Attempts were made to represent all layers of paint in the samples collected. As analytical results are referenced to the surface paint colour only, the lead content of all painted surfaces similar to that represented by the surface paint colour were presumed to be the same, regardless of differing sub surface paints, if any.
- Due to height restrictions and the risk of electrical shock in handling operational light fixtures, the ballasts present in the fixtures observed were not inspected for PCB labels. Conclusions and recommendations regarding the presence of PCBs are based on limited observations in combination with information provided by building staff regarding lighting renovations (where requested by Stantec, based on visual observations) and are presented to provide guidance regarding the likelihood that PCB-containing equipment is or is not present. The exact extent and/or number of fluorescent lamp ballasts containing PCBs, if any, will not be commented on.

  - Although they may also be present in other items in limited amounts (e.g., plastics, molded rubber parts, applied dried paints, coatings or sealants, caulking, adhesives, paper, sound-deadening materials, insulation, or felt and fabric products such as gaskets), PCBs are not expected to be present in those materials in concentrations that would necessitate the requirement for PCB-specific handling procedures, separate removal and/or disposal considerations for renovation or demolition. As such, these items were not considered in our assessment.

- Visual assessment for the presence of suspected visible mould and/or suitable conditions for mould growth (e.g., moist and/or water-stained building materials) was conducted. The conclusions made in this report provide description(s) of the potential source(s) of moisture that may have led to suitable conditions for mould growth, only in those cases where potential source(s) of moisture were identified. The visual assessment did not include an intrusive assessment. The conclusions provided herein will not necessarily identify all sources of moisture leading to suitable conditions for mould growth within the impacted area(s).
  - This assessment does not constitute a building envelope/building systems assessment, which would include an intrusive investigation to assess the internal condition, potential moisture sources, and expected remaining service life of the various components and systems comprising the envelope of a building.
- The potential presence of mercury or mercury-containing equipment in inaccessible areas or as internal parts of HVAC mechanisms or other equipment was not assessed.
  - Although limited amounts of mercury may be present in paints and adhesives, mercury is not expected to be present in those materials in concentrations that would necessitate the requirement for mercury-specific handling procedures, separate removal and/or disposal considerations for renovation or demolition. As such, these items were not considered in our assessment.
- Investigation was limited to a visual review in accessed areas of readily accessible building-related cooling and refrigeration equipment which could contain ODSs. Testing was not conducted. Equipment or materials that were not assessed but that may contain ODSs included, but were not limited to, portable equipment (including domestic-type refrigerators and water coolers, tenant-related refrigeration equipment), flexible plastic foam or rigid insulation foam, solvents, aerosol spray propellants and fire extinguishing equipment.
- In general, the assessment for the presence of hazardous building materials was visual in nature and was conducted pertaining to readily visible surfaces within accessible accessed spaces only. Additional hazardous building materials are potentially present in inaccessible areas not assessed including, but not limited to ceiling spaces, wall cavities, crawlspaces, and buried materials.

2.1.2 Areas Not Accessed

The following areas were not accessed, for the reasons indicated:

- rooftop (safe access not available)

As such, limited comments, if any, will be provided regarding the presence, quantity or condition of hazardous building materials within the above-noted areas.

3.0 FACILITY DESCRIPTION

The Ruth Inch Memorial Pool is located at 6002 Franklin Ave, Yellowknife, Northwest Territories, and consists of a two-level building with an attic and crawlspace. The lower level consists of the maintenance and operations rooms and the upper level consists of the pool deck, lobby, changerooms and offices.

The reported construction date of the building was 1988. This construction time period is consistent with those dates when hazardous building materials were commonly used.

The typical structural components, mechanical components and building finishes associated with this building consist of the following:

- foundation – concrete
- exterior cladding – aluminum siding
- structural – wood framing and concrete walls and floors
- mechanical – insulated and un-insulated pipes and systems
- heating, ventilation and air conditioning (HVAC) – pellet fuel and diesel
- interior walls – combination of finished drywall, wood, concrete, masonry block and ceramic tile
- interior ceilings – combination of finished drywall, concrete, wood and suspended ceiling tiles
- interior flooring – combination of bare concrete, wood, ceramic tiles and vinyl sheet flooring
- roofing material – aluminum

4.0 HAZARDOUS BUILDING MATERIALS ASSESSMENT

Methodology, findings and recommendations are provided on a material-by-material basis in the following sub-sections, for each of the hazardous building materials considered in this assessment.

Background information along with information regarding health effects and the regulatory framework for each of the hazardous building materials considered is provided in Appendix A.

Floor plans showing the locations of samples collected during this assessment and the locations of the limited hazardous building materials are provided in Appendix B.

4.1 ASBESTOS

4.1.1 Methodology

The presence of asbestos in the workplace in Northwest Territories is governed by the NWT OHS Reg. According to that regulation:

> "asbestos" means any manufactured article or other material which contains
>
> a) 1% or more asbestos by weight at the time of manufacture, or
> b) 1% or more asbestos as determined using microscopy, stereo and polarized light, with dispersion staining, pursuant to the National Institute for Occupational Safety and Health Manual of Analytical Methods, Method 9002, Issue 2, as amended from time to time;
>
> "asbestos-containing material" means any material that is likely to or contains asbestos.

The WSCC (May 2017) Asbestos CoP document is used by Occupational Health and Safety (OHS) officers as a guide when reviewing abatement work practices and employer codes of practice. According to this document:

> “requirements are based on the potential for asbestos fibres to be released when the material is disturbed, not on the amount of asbestos in the material.
>
> The employer must comply with the asbestos requirements when:
>
> - the individual material in question contains more than one per cent asbestos (by weight)
> - the material contains less than one per cent asbestos, but it is known that a “restricted area” is likely to occur when it is disturbed (e.g., vermiculite)
> - the material contains less than one per cent asbestos and there is a reasonable chance that asbestos fibres may be released when the material is disturbed, either due to the condition of the material or the work procedures that will be used (e.g., removal of friable stipple material, dry removal of wall and ceiling plaster or drywall where the materials contain low levels of asbestos).
>
> Materials identified as containing less than one per cent asbestos such as drywall joint compounds and stipple may not have been uniformly mixed when they were applied and could contain asbestos in concentrations greater than one per cent in sections. When dealing with large quantities of such materials, employers should take nonhomogeneous mixtures into consideration.”

In accordance with the intentions of the above regulations and guidance documents, and for the purpose of this report, ACM will mean any material that contains more than 1% asbestos by weight, or vermiculite insulation and wall/ceiling finish materials containing any asbestos.

Based on the above criteria, a visual assessment of accessible areas was undertaken in order to check for the presence of materials suspected to contain asbestos. Locations to collect discrete bulk asbestos samples of suspect building materials were identified. Samples of representative materials were then collected at these locations.

Multiple samples were collected from each “homogenous application” of observed suspected ACMs (materials suspected to contain asbestos that are uniform in material type, colour, texture application and estimated installation date) and submitted to EMSL Canada Inc. (EMSL) in Burnaby, BC for analysis of asbestos content using polarized light microscopy (PLM) with dispersion staining, in accordance with the United States Environmental Protection Agency (USEPA) 600/R-93/116 method. EMSL’s analytical laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

The number of samples to be collected for each homogenous application of a suspected ACM was based on accepted occupational hygiene standards and protocols, on the recommendations provided in the Asbestos CoP, and on the assessor’s experience and understanding of the consistency of that building material’s application.

4.1.1.1 Assessment for Vermiculite Insulation

As part of the assessment, Stantec reviewed the subject building for areas where vermiculite insulation, a potential ACM, would likely be present. This included making note of and assessing attic spaces, floor cavities and masonry block or brick walls, which are typical areas where vermiculite is found. Where masonry units or other inaccessible void spaces in walls were observed, destructive assessment (drilling or otherwise penetrating the exposed material) was NOT conducted to assess the cavity or void space for the presence of vermiculite.

4.1.1.2 Asbestos Sampling Quality Assurance/Quality Control

Sampling activities pertaining to asbestos were conducted in accordance with Stantec’s safe work practices, which take into account current provincial and/or territorial regulations pertaining to such work (i.e., sampling procedures, required number of samples and laboratory analytical procedures).

Representative bulk samples were collected of accessible suspect ACMs in sufficient quantities for laboratory analysis. Suspect ACM samples were sealed in polyethylene zip-lock bags labeled with the sample number, suspect material description, and sample location. As part of sampling procedures, sampling tools were cleaned between sample collection events to avoid the potential for cross-contamination of samples.

All sample bags were compiled in order and placed into a single container accompanied with a chain of custody form outlining the project information, date, building location, number of samples, and sample description. Samples were submitted to the analytical laboratory in a sealed container via courier.

4.1.1.3 Sample Results Interpretation

When asbestos is detected in concentrations greater than 1% percent in one of the samples within a set that was collected to represent a “homogenous application” of a particular material (or detected in any concentration, in a set of samples collected for applications of vermiculite and wall/ceiling finish materials), the entire sample set, and the entire application of that material is then considered to be an ACM.

In addition to the above, a “positive stop” option was requested for laboratory analysis of the building material samples submitted for asbestos analysis. The “positive stop” option is utilized by the laboratory when asbestos is detected at a concentration of greater than half of one percent in one of the samples within a set that was collected to represent a “homogenous application” of that material (or in any concentration, for vermiculite). At this point, further analysis of subsequent samples within the set is deemed to be unnecessary (as the entire set will be considered an ACM, per above), and the remainder of the samples within the set are not analyzed.

Lastly, when interpreting results for materials with trace amounts of asbestos detected, the “friability” of the material is also considered. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres.

4.1.1.4 Assessment of Material Condition

A visual assessment of the condition and accessibility was also completed for each occurrence of suspect ACM. A description of the criteria used in evaluating the condition, accessibility and exposure risk of ACMs is provided Appendix A. The criteria are generally based on the June 5, 2017 Public Services and Procurement Canada “Asbestos Management Standard” and industry standards of practice.

4.1.2 Findings

A summary list of the bulk samples collected by Stantec, including a description of the material, sampling location and laboratory test results is provided in Appendix C. Copies of the Laboratory Certificates of Analysis for bulk samples analyzed are provided in Appendix D.

Based on our observations of building construction (estimated vintage of interior finishes and uniformity of building material use) and on our interpretations of the analytical results of suspected ACMs collected through this assessment, ACMs were not identified.

4.1.2.1 Presumed Asbestos-Containing Materials

The following building materials were observed to be present but not sampled, and are listed as PACMs:

- products associated with ceramic tiles (e.g. grout and adhesive) associated with various styles of ceramic tile in various locations throughout
- brick mortar associated with white 8”x8” block walls throughout upper floor changerooms

These materials were observed to be in good condition. These materials were not sampled to preserve their integrity and due to height restrictions. Sampling of these materials was not part of the scope of work as determined by Stantec’s understanding of the Project. As these materials are known to have been manufactured with asbestos, they should be presumed to be asbestos-containing unless proven otherwise through appropriate assessment and testing.

4.1.2.2 Non-Asbestos-Containing Materials

The bulk samples collected during this assessment for which no asbestos was detected through laboratory analysis can be seen in the table in Appendix C.

Materials Not Suspected to Contain Asbestos

Various materials within the subject building were observed and/or presumed to be present, which are not suspected to contain asbestos. Typical materials of this nature that were observed and are not considered suspected ACMs, include but are not limited to the following:

- materials comprised of glass, such as:
  - window panes
  - pre-formed fibreglass insulation on mechanical pipes or vessels (potentially excluding attached wrap layers)
  - fibreglass batt insulation in wall, floor or ceiling cavities, or used in other applications (potentially excluding attached paper backing)
  - lights and lighting components
- materials comprised of metal, such as:
  - wall framing
  - flashings on siding or roofs
  - electrical wiring (excluding wrap) and conduit
  - plumbing components
  - components of doors, windows and associated trim
  - structural components
  - handrails
  - siding
  - roofing
- materials comprised of wood, such as:
  - wall framing
  - components of doors, windows and associated trim
  - structural components
  - handrails
  - ceiling
- other materials generally not suspected to contain asbestos:
  - drywall board/"drywall" (excluding suspected ACM finishing compounds)

- poured concrete items such as foundations, floors, or structural beams (excluding suspected ACM finishing compounds)
- granite, slate, ceramic or other non-suspect stone-like materials (excluding grouts or adhesives)
- masonry units such as bricks or blocks (excluding mortar or potential loose-fill insulation)

4.1.2.3 Potential for Vermiculite Insulation

It should be noted that various walls of the subject building were comprised of masonry units (concrete blocks and/or bricks). Asbestos-contaminated vermiculite was historically used as insulating material in masonry wall construction. To assess for this potential ACM in masonry units, destructive sampling is required, which was not conducted as part of this assessment. The presence of this potential ACM in masonry wall cavities cannot be ruled out without destructive testing.

Aside from potential presence in masonry wall cavities, no vermiculite or other locations that may potentially contain vermiculite (that could not otherwise be assessed) were observed.

4.1.3 Recommendations

No ACMs were identified through this assessment. General recommendations regarding potential ACMs within the subject building are as follows:

- Should a material suspected to contain asbestos fibres become uncovered during renovation or other activities, all work in the areas that may disturb the material should be stopped. Assessment and testing should be conducted by a qualified person to determine asbestos content. Confirmed ACMs should be handled in accordance with the requirements of the NWT OHS Reg. and the Asbestos CoP.
- Prior to renovation, demolition or other activities that would disturb them, undertake testing of PACMs that may be impacted to determine their asbestos content. Assessment and testing should be conducted by a qualified person, and materials confirmed as ACMs should be handled by appropriately trained personnel (e.g., asbestos abatement contractor personnel), in accordance with the requirements of the NWT OHS Reg. and the Asbestos CoP.
- Asbestos-containing cement pipe may be present below ground—caution should be used at any time when excavation is required.
- If masonry block walls are to be impacted by renovation and/or demolition work, and these walls have not been checked for the presence of vermiculite insulation, intrusive assessments for vermiculite should be undertaken prior to renovation/or demolition work. If vermiculite insulation is present, this material should be treated as an ACM until assessment and testing conducted by a qualified person confirms otherwise.
- In the event that ACMs are identified and asbestos waste is created, ensure asbestos waste is handled, stored, transported, and disposed of in accordance with the requirements of the following:
  - Federal Transportation of Dangerous Goods Regulation
  - Asbestos CoP

- Government of the Northwest Territories:
  - *Guideline for Hazardous Waste Management* (2017)
  - *Guideline for the Management of Waste Asbestos* (2004)

4.2 LEAD

4.2.1 Methodology

A visual assessment of accessible areas was undertaken in order to check for the presence of materials that may contain lead. These materials included paint applications, wiring and plumbing, batteries, etc.

4.2.1.1 Lead in Paint

The WSCC May 2017 document *Working with Lead Guideline* (Lead Guideline) defines "Lead-containing materials" as industrial materials, including lead paints and coatings that contain 0.1% (equivalent to 1,000 mg/kg, or 1,000 parts per million) lead or greater.

This document also indicates that risk assessments associated with lead exposure must include an assessment of the hazards, concentrations and related work activities to determine appropriate control measures. When evaluating potential lead exposures associated with disturbance to surfaces coated with lead-containing products, various occupational health and safety administrations have indicated the following:

- Improper removal of lead paint containing 600 mg/kg lead results in airborne lead concentrations that exceed half of the exposure limit for lead, when the occupational exposure limit is 0.05 milligrams per cubic metre (mg/m^3), as it is in the Northwest Territories.
  - This potential for exposure exceeding half of the occupational exposure limit would be the trigger for implementation of an exposure control plan.
- Lead concentrations as low as 90 mg/kg may present a risk to pregnant women and children
  - Any risk assessment should include for the presence of high risk individuals within the workplace.

When reviewing the above, "high risk" individuals are not expected to be present in the workplace associated with this building during operations and maintenance or building material alteration activities (i.e., renovation) that would create significant disturbance to paint with such individuals present. As such, paints containing 600 ppm lead or more will be considered "lead-containing" for the purpose of this report, such that appropriate risk assessments can be completed for ongoing operations and maintenance. However, information regarding the lead content of all paints tested is provided herein, for reference and risk assessment should the consideration of high risk individuals be necessary, based on the requirements of a particular situation.

Based on the above, samples of potential LCPs were collected from major paint applications, in sufficient quantity to conduct analysis for total lead content. The sampling of paint applications involved the collection of paint chip samples of paint layers to the substrate, where possible. A minimum volume of 5 cc or a half teaspoon of paint chips was typically collected.

Wherever necessary and possible, paint was separated from any backing material such as paper, concrete or wood and placed in a sealed, clearly labelled plastic bag.

Samples collected were submitted to EMSL Calgary for analysis of total lead content using EPA Method SW 846 3050B*/7000B. EMSL's analytical laboratory is also accredited by the AIHA Environmental Lead Laboratory Approval Program (ELLAP).

4.2.1.2 Assessment of Paint Condition

The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* and are further detailed in Appendix A.

4.2.2 Findings

A summary list of the samples collected including a description of the samples, sampling locations and laboratory analytical results is provided in Appendix F. Copies of the Laboratory Certificates of Analysis for paint chip samples analyzed are included in Appendix G.

Based on our observations and interpretations of suspected LCP sample analytical results, the paints presented in the table in Appendix H were identified as LCPs.

The following information is included for each identified LCP:

- paint colour
- substrate to which paint is applied
- location/approximate extent of the LCP within the building
- lead content of paint
- condition
- representative photographs, where available

Lead is also expected to be present in the following within the subject building:

- lead-acid batteries used in emergency lighting
- older electrical wiring materials and sheathing
- solder used on domestic water lines
- solder used in bell fittings for cast iron pipes and electrical equipment
- ceramic tile glaze
- vent and pipe flashings

4.2.3 Recommendations

LCPs in poor condition should be addressed. This would include removal of loose/flaking LCP from surfaces. Consideration should be given to re-painting surfaces where LCPs are delaminating, to mitigate the potential for additional delamination and distribution of LCP waste within the area.

Lead-containing materials, including paints with varying concentrations of lead, can be managed in place, where in good condition.

If paints or other lead-containing equipment/materials within the subject building are to be disturbed and/or removed, including in instances where delaminating LCPs are addressed or including in instances where paint chip debris is removed and/or paint debris is created (e.g., preparing surfaces for re-painting), ensure compliance with the following:

- Government of the Northwest Territories:
  - *Guideline for the Management of Waste Lead and Lead Paint* (2017)
  - *Guideline for Industrial Waste Discharge in the NWT* (2004)
  - *Guideline for Hazardous Waste Management* (2017)
  - *Guideline for the Management of Waste Batteries* (1998)
- NWT OHS Reg., including the provisions of the Lead Guideline
- Federal Transportation of Dangerous Goods Regulation.

Corrective action or remedial work on paint applications containing any concentration of lead should be undertaken in a manner so as to avoid generating fine particulate matter or dust (i.e., avoid sanding). Airborne lead dust or fumes should not exceed the WSCC eight-hour occupational exposure limit (OEL) of 0.05 mg/m^3 during the removal of and/or disturbance to paints and products containing any concentration of lead.

Ultimately, the employer is responsible to review the work tasks required and the ways in which materials (including those coated with paints that may contain lead in varying concentrations) will be impacted, as well as the individuals that will be present in the immediate vicinity of the work (i.e., potential for high-risk individuals) in order to determine the appropriate personal protective equipment (PPE—including respirators and protective clothing), containment and/or decontamination measures and work procedures that should be followed to protect workers from lead exposure.

4.3 POLYCHLORINATED BIPHENYLS

4.3.1 Methodology

A visual review for the presence of PCBs in electrical equipment was completed. Equipment that is generally suspected of containing PCBs includes lamp ballasts, transformers, hydraulic systems, compressors, switchgear and capacitors.

No sampling of dielectric fluids was undertaken as part of this assessment.

4.3.2 Findings

PCBs may be present in the fluorescent light ballasts of the approximately 100 light fixtures observed. As the ballasts were energized, they could not be inspected at the time of the assessment for health and safety reasons.

4.3.3 Recommendations

Fluorescent lamp ballasts that may contain PCBs can be managed in place, where these items are operating and in good condition. No further action is currently required until such time that renovation or demolition activities are to be conducted, or until 2025, when PCB-containing ballasts will require removal and disposal.

When decommissioned, verify the PCB content of fluorescent lamp ballasts as per the Environment Canada publication *Identification of Lamp Ballasts Containing PCBs*, 1991, or equivalent reference.

Should a material suspected to contain PCBs become uncovered during renovation or other activities (i.e., dielectric fluids, hydraulic fluids), all work in the areas that may disturb the material should be stopped. Samples of the suspect material should be submitted for laboratory analysis to determine if PCBs are present.

PCB-containing items identified for removal and disposal should be handled, transported, stored and disposed of in accordance with the following:

- Government of the Northwest Territories *Guideline for Hazardous Waste Management* (2017)
- Federal Transportation of Dangerous Goods Regulation
- Federal PCB Regulations (SOR/2008-273).

4.4 MOULD

4.4.1 Methodology

Stantec reviewed the subject building visually for conditions conducive to mould growth, such as moisture impacted/stained building materials or evidence of unintended moisture on building materials (e.g., floods, leaks, moisture intrusion, etc.). The presence of suspect visible mould was assessed through visual observations. Material observed with dark-coloured staining and/or a textured and discoloured appearance is described as “suspected mould”. Mould identified visually is defined as “suspected mould” unless it is confirmed as mould by laboratory analysis.

The scope of work and procedures utilized for the visual assessment considered the recommendations for such provided in the documents listed below:

- Standard Construction Document CCA 82 *Mould Guidelines for the Canadian Construction Industry*, Canadian Construction Association, 2018 (referred to as CCA 82)

- *Fungal Contamination in Public Buildings: Heath Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health, 2004 (referred to as the Health Canada Guide)
- *Indoor Air Quality in Office Buildings: A Technical Guide*, Report of the Federal-Provincial Advisory Committee on Environmental and Occupational Health, 1995 (referred to as the IAQ Guide)
- *Bioaerosols: Assessment and Control*, American Conference of Governmental Industrial Hygienists (ACGIH), 1999 (referred to as the ACGIH Report)
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA, Second Edition 2005

4.4.2 Findings

The observations pertaining to mould and/or moisture that were made during this assessment are summarized in Table 1, below.

Table 1 Mould/Moisture Observations Summary—May 18, 2022
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

Building Area	Observation	Suspected Source of Moisture	Photo
Lower level, staff room	Moisture-stained ceiling tiles in lower-level staff room	Pipe leak	

4.4.3 Recommendations

Documents published by Health Canada, Ontario Ministry of Health, AIHA, ACGIH and others, provide guidance for interpreting the results of mould investigations. The Health Canada Guide states that:

> "current knowledge supports the need to prevent damp conditions and mold growth and to remediate any fungal contamination in buildings."

To this end, Stantec recommends the following course of action within the subject building:

- Remove and replace moisture-stained ceiling tiles with new tiles. If staining re-appears on the new tiles, the source of moisture should be identified and corrected.
  - This work can be conducted by regular facility maintenance staff, if conducted prior to the onset of mould growth.

4.5 MERCURY

4.5.1 Methodology

An assessment for equipment that is likely to contain mercury (such as thermostats, thermometers and fluorescent light tubes) was completed visually. Information on the type of equipment (i.e., gauges, switches, batteries, thermometers, etc.), model and serial numbers and quantities was recorded, where such information was available.

4.5.2 Findings

Mercury vapour is present in the light tubes within the approximately 100 fluorescent light fixtures observed.

4.5.3 Recommendations

Identified mercury-containing items can be managed in place, therefore no further action is recommended at this time. Mercury vapour within light fixtures poses no risk to workers or occupants provided the mercury containers remain intact and undisturbed.

Complete removal of mercury-containing equipment is required prior to renovation or demolition activities that may disturb the equipment. When mercury-containing items (e.g., fluorescent light bulbs/tubes) are removed, ensure all mercury waste is handled, stored transported and disposed of in accordance with the requirements the following:

- Government of the Northwest Territories *Guideline for Hazardous Waste Management (*2017)
- Federal Transportation of Dangerous Goods Regulation.

Precautions should be taken if workers may potentially be exposed to mercury or mercury vapours to ensure that workers exposure levels do not exceed the occupational exposure limit of 0.025 mg/m^3 as per the NWT OHS Reg. This can be achieved by providing respiratory and skin protection applicable to the hazard and task to be completed.

4.6 OZONE DEPLETING SUBSTANCES

4.6.1 Methodology

An assessment for equipment or systems likely to contain ODSs (such as refrigeration/cooling equipment or fire suppression systems) was completed visually. Information on the type of equipment, manufacturer and type and quantity of refrigerants was recorded, where available.

4.6.2 Findings

Building-related refrigeration equipment observed was confirmed (by label information) to be charged with refrigerants that are not considered ODSs.

4.6.3 Recommendations

As no suspect ODS-containing equipment was observed within the subject building during the assessment, no recommendations have been provided.

4.7 SILICA

4.7.1 Methodology

An assessment for the presence of silica was conducted visually. The presence of typical silica-containing building materials such as concrete, masonry, stone, terrazzo, refractory brick, drywall, ceramic tile, ceiling tile and other items, was noted.

4.7.2 Findings

Silica is expected to be present in the following, which were observed in various locations throughout:

- cement products such as:
  - concrete—foundations, floors, walls
  - brick/masonry units and associated grout and mortar
  - stone/ceramic floor tiles and associated grouts and mortars
- drywall and associated wall/ceiling finish materials
- suspended ceiling tiles

4.7.3 Recommendations

Silica-containing materials can be managed in place; therefore, no further action is recommended at this time.

If silica-containing materials within the subject building are to be disturbed and/or removed (e.g., coring through concrete slabs, demolition of masonry or concrete units), ensure dust control measures are employed such that airborne silica dust concentrations do not exceed the exposure limit as stipulated by NWT OHS Reg. (cristobalite and quartz—each 0.05 mg/m^3). This would include, but not be limited to, the following:

- providing workers with respiratory protection
- wetting the surface of the materials, and use of water or dust suppressing agents to prevent dust emissions
- providing workers with facilities to properly wash prior to exiting the work area

5.0 CLOSURE

This report has been prepared for the sole benefit of KPMG on behalf of the City of Yellowknife. Any use which a third party makes of this report, or any reliance on decisions based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professionals and technical staff in accordance with generally accepted engineering, scientific and occupational health and safety practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec Consulting Ltd. based on the data obtained from the work. The conclusions are based on the site conditions encountered by Stantec Consulting Ltd. at the time the work was performed at the specific assessment and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on building construction and conditions, building usage and other factors. Due to the nature of the investigation and the limited data available, Stantec Consulting Ltd. cannot warrant against undiscovered environmental or health and safety liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

We trust that the above is satisfactory for your purposes at this time. Should you have any questions or concerns, or require additional information, please do not hesitate to contact the Stantec Project Manager at your convenience.

APPENDIX A

Hazardous Building Materials Background Information, Health Effects Information and Regulatory Framework

Appendix A HAZARDOUS BUILDING MATERIALS BACKGROUND INFORMATION, HEALTH EFFECTS INFORMATION AND REGULATORY FRAMEWORK

A.1 ASBESTOS

Asbestos is a naturally occurring form of fibrous silicate that is durable and flexible; has high thermal and tensile strength; is resistant to heat, chemical corrosion and friction; does not conduct electricity; and insulates well against condensation, heat and noise. Due to these properties, asbestos was used in over 3,000 commercial products, and it is estimated that approximately 70% of the asbestos that was used in North America was used in building materials.

In buildings, and among many other potential asbestos-containing materials, asbestos is typically found in wall finish (joint compound, plaster), mechanical insulation, gaskets, thermal insulation on pipes, refractory material, roofing felts, floor tiles, ceiling tiles and parging, heat resistant panels, incandescent light fixture reflector plates, and any other material requiring a high degree of durability or thermal resistance.

Asbestos-containing materials are grouped into two classifications, friable and non-friable materials. Friable ACMs are those that can easily be crumbled or broken apart by mere hand pressure. When these materials break apart asbestos fibres are then released into the atmosphere. Non-friable ACMs or “manufactured products” are materials that by the nature of their manufacturing/construction do not readily allow the release of asbestos fibres, unless they are cut or shaped with power tools. Some materials such as plaster, wallboard joint compound and ceiling tiles are considered to be non-friable in an undisturbed state, but can become friable when damaged or disturbed.

The common use of asbestos in various building materials started to decline as a result of changes in industry practices and/or legislation beginning in the mid-1970s. For example, the spray application of asbestos-containing fireproofing was prohibited in 1986. Although many types of ACMs were no longer in use by the 1990s, some ACMs, primarily non-friable materials such as asbestos cement products (e.g., pipes, shingles, wall panels) and sealants (e.g., roofing products, firestopping products, penetration sealants, pipe thread sealants) saw continued use. A material known as vermiculite, which was found to be asbestos-contaminated as a result of the co-occurrence of asbestos forms in the vermiculite mineral deposits, was used into the mid-1990s for insulation within attics, floor spaces or within masonry block wall systems. Asbestos was still used in selected building materials through the end of 2018 in Canada, when an official ban on the import, manufacture, sale, trade or use of asbestos-containing products was implemented.

A.1.1 Health Effects

Undisturbed asbestos within building materials poses no health risks. Asbestos poses a risk when building materials containing asbestos are impacted or disturbed, thereby releasing the asbestos fibres into the air, making them available for inhalation.

Asbestos-related diseases are caused when suspended airborne asbestos fibres are inhaled and the fibres settle into various regions of the lungs and remain for extended periods. Once embedded in the lungs the asbestos fibres cause scarring within the lung tissue, ultimately leading to impaired lung function (asbestosis) and/or various cancers (lung cancer; mesothelioma). These asbestos-related diseases are irreversible and fatal. The risk of lung-related cancers resulting from asbestos exposure is increased in individuals who smoke.

Asbestos-related diseases most often occur in individuals who have been exposed to high concentrations of airborne asbestos over a long period of time, though mesothelioma has been found in individuals that reported short-term exposures. Symptoms or the development of asbestos-related diseases have a latency period of approximately 15 - 40 years, meaning that they may not occur until many years after exposure. This makes it extremely difficult to determine a safe level of exposure.

A.1.2 Regulatory Framework

The presence of asbestos in the workplace in Northwest Territories is governed by the NWT OHS Reg. According to that regulation:

> "asbestos" means any manufactured article or other material which contains
>
> c) 1% or more asbestos by weight at the time of manufacture, or
> d) 1% or more asbestos as determined using microscopy, stereo and polarized light, with dispersion staining, pursuant to the National Institute for Occupational Safety and Health Manual of Analytical Methods, Method 9002, Issue 2, as amended from time to time;
>
> "asbestos-containing material" means any material that is likely to or contains asbestos.

The WSCC (May 2017) Asbestos CoP document is used by Occupational Health and Safety (OHS) officers as a guide when reviewing abatement work practices and employer codes of practice. According to this document:

> “requirements are based on the potential for asbestos fibres to be released when the material is disturbed, not on the amount of asbestos in the material.
>
> The employer must comply with the asbestos requirements when:
>
> - the individual material in question contains more than one per cent asbestos (by weight)
> - the material contains less than one per cent asbestos, but it is known that a “restricted area” is likely to occur when it is disturbed (e.g., vermiculite)

- the material contains less than one per cent asbestos and there is a reasonable chance that asbestos fibres may be released when the material is disturbed, either due to the condition of the material or the work procedures that will be used (e.g., removal of friable stipple material, dry removal of wall and ceiling plaster or drywall where the materials contain low levels of asbestos).

Materials identified as containing less than one per cent asbestos such as drywall joint compounds and stipple may not have been uniformly mixed when they were applied and could contain asbestos in concentrations greater than one per cent in sections. When dealing with large quantities of such materials, employers should take nonhomogeneous mixtures into consideration."

The Asbestos Code of Practice also provides significant additional background information pertaining to asbestos, along with details on health effects and other applicable legislation within the Northwest Territories (e.g., the federal *Hazardous Products Act*, the Northwest Territories Building Code and waste disposal regulations).

According to the Government of the Northwest Territories *Guideline for the Management of Waste Asbestos* (2004), asbestos-containing material (ACM) means any material which contains 1% or more asbestos by volume.

Disposal of asbestos waste is governed by the *Guideline for the Management of Waste Asbestos*. The Federal Transportation of Dangerous Goods Regulation sets out the requirements for the proper transport of asbestos waste in the Northwest Territories. In general, and for transportation and disposal, the waste must be placed in a double sealed container, properly labeled, free of cuts, tears or punctures and disposed of at a licensed waste station which has been properly notified of the presence of asbestos waste.

A.1.3 Assessment of Condition

When conducting ACM assessments, it is important to note the condition of the ACMs identified. Protocols for assessing condition of identified are generally based on the June 5, 2017 Public Services and Procurement Canada "Asbestos Management Standard" and industry standards of practice, as summarized in the following sections.

Friable ACMs other than Mechanical Insulation

In evaluating the condition of friable ACMs other than mechanical insulation (e.g., spray-applied as fireproofing, texture, decorative or acoustic finishes), the following criteria apply:

Good

- Surface of material shows no significant signs of damage, deterioration or delamination. Up to one percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the Assessor to be familiar with the irregular surface texture typical of sprayed asbestos products.

GOOD condition includes un-encapsulated or un-painted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

Poor

- Sprayed materials show signs of damage, delamination or deterioration. More than one percent damage to surface of ACM spray.

In observation areas, where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the Assessor's assessment form.

Fair condition is not utilized or considered as a valid criterion in the evaluation of sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray-applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes, which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling area are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of building with ACM, regardless of the reported condition.

Mechanical Insulation

In evaluating the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment, etc.) the following criteria are used:

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 surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

Fair

- Minor penetration 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 should be minor to none.

Poor

- Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired. 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. In these circumstances, it is not possible to observe each foot of mechanical insulation from all angles.

Non-Friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material will be treated as a friable product, and evaluated per the above criteria.

Asbestos-Containing Material Debris

Debris from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as debris.

Debris from Damaged Non-Friable ACM

The presence of fallen ACM, from damaged non-friable ACM, is reported separately from the non-friable ACM source. Only fallen non-friable ACM that has become friable, is reported as debris.

A.2 LEAD

Lead may be used in its pure metallic form or combined chemically with other elements to form lead compounds. Metallic lead is used to make products such as electric storage batteries, ammunition, lead solder, radiation shields, pipes, flashing materials and sheaths for electric cables. Metallic lead is sometimes combined with other metals such as copper, tin and antimony as lead alloys for use in the manufacture of a variety of metal products.

Organic lead compounds contain a lead atom covalently bonded to carbon. Common examples of organic lead compounds include lead “soaps” such as lead oleates, high pressure lubricants, and anti-knock agents in gasoline.

Inorganic lead compounds (or lead salts) result when lead is combined with an element other than carbon. Examples are lead oxide, lead chromate, lead carbonate and lead nitrate. Inorganic lead compounds may occur as solids or in solutions, and are used in insecticides, pigments, paints, frits, glasses, plastics, and rubber compounds.

Lead is commonly found in buildings in items such as the solder used on copper domestic pipes; the caulking on bell fittings of cast iron drainage pipes; electrical equipment/wiring; batteries (e.g., emergency exit signage batteries); lead sheeting (e.g., x-ray rooms); vent and pipe flashings. Lead was also incorporated into paints and ceramic tile glazes to accelerate drying, increase durability, maintain a fresh appearance, and resist moisture that causes corrosion.

A.2.1 Health Effects

Elemental lead and inorganic lead compounds are absorbed through ingestion or inhalation and can incorporate into the bone marrow, nerve tissue, brain, and kidneys. In children, symptoms of lead poisoning can include headaches, irritability, abdominal pain, vomiting, anemia, weight loss, poor attention span, noticeable learning difficulty, slowed speech development, and hyperactivity. In adults, symptoms of lead poisoning can include pain, numbness or tingling of the extremities, muscular weakness, headache, abdominal pain, memory loss, unsteady gait, pale skin, weight loss, vomiting, irritability, and anemia. Although adults are susceptible to the toxic effects of lead, children are at high risk due to the nature of a child's activities that involve the introduction of non-food items into their bodies.

Excessive airborne lead and surface contamination can be transferred to employees' hands and may results in lead ingestion. Therefore, work practices intended to minimize surface lead concentrations, such as frequent cleaning of work surfaces should be included in an overall lead exposure control plan.

A.2.2 Regulatory Framework

In the past, the United States Department of Housing and Urban Development (HUD) set a criterion of lead-based paint as 0.5% lead (by weight) or 5,000 parts per million (ppm) for evaluating whether lead is a hazard in a residential setting.

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal *Hazardous Products Act* provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm (2005) to 90 ppm (2010). However, it is important to note that this regulation does not comment on the potential occupational exposure if the material is disturbed.

Under the NWT OHS Reg., a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. Per the NWT OHS Reg., the OEL for airborne lead dust or fumes should not exceed the TWA value of 0.05 milligram per cubic metre of air (mg/m^3). The OEL represents the time-weighted average concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

With respect to potential lead exposures associated with disturbance to surfaces coated with lead-containing products, various occupational health and safety administrations have indicated that working with materials coated with paint that has a lead content that exceeds 600 ppm can lead to exposures in excess of 50% of the occupational exposure limit for lead, when the occupational exposure limit is 0.05 mg/m^3, as it is in the Northwest Territories. Work procedures that can be used to assist in protecting workers and adjacent work areas from exposure to lead during disturbance activities can be found in such documents (e.g., WorkSafeBC publication entitled *Lead-Containing Paint and Coatings: Preventing Exposure in the Construction Industry*, 2011).

The WSCC document *Working with Lead Guideline* (Lead Guide) is used by Occupational Health and Safety officers as a guide when reviewing abatement work practices and employer codes of practice. The Lead Guide provides significant information pertaining to lead and lead-containing paints, along with details on health effects, employer responsibilities, assessing risks and controlling exposure. Lead-containing materials are defined in the Lead Guide as:

> "Industrial materials, including lead paints and coatings that contain 0.1 (or greater) weight % of dry lead, and any lead debris or dusts that were produced from manipulating such industrial lead containing materials."

The Lead Guide can also be referenced when assessing potential lead exposures associated with disturbance to surfaces coated with lead-containing products. Although this document provides some guidance as to what concentrations of lead in paint can create airborne exposure hazards when disturbance occurs, the employer is ultimately still responsible to review the work tasks required and the ways in which paint coatings will be impacted, as well as the individuals that will be present in the immediate vicinity of the work in order to determine the appropriate exposure controls.

Regarding waste, according to the Government of the Northwest Territories 2017 documents *Guideline for Hazardous Waste Management* and *Guideline for the Management of Waste Lead and Lead Paint*, lead waste may be considered a toxic leachate (and require special disposal) if lead is in a dispersible form and its leachate contains greater than 5.0 milligrams per litre (mg/L) lead. Although materials coated with paints containing higher concentrations of lead may be more likely to create waste that is leachable in excess of 5.0 mg/L, there is not a direct relationship between the lead content of paint and the leachable lead content of waste. For this reason, supplemental testing, which involves sampling of both paint and substrate for appropriate analysis, is typically required to determine the leachable lead content of waste.

The Federal Transportation of Dangerous Goods Regulation and the Government of the Northwest Territories Guideline for Hazardous Waste Management set out the requirements for the proper transport of lead waste in the Northwest Territories.

A.2.3 Condition Evaluation for Lead-Containing Paints

The criteria for condition evaluation pertaining to LCPs described herein are generally based on the United States Housing and Urban Development (HUD) 2012 *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing*, as summarized in this section.

When evaluating the condition of LCPs, an attempt should be made to determine whether the deterioration is due to a moisture problem or some other existing building deficiency.

"Poor" surfaces are considered to be a hazard and should be corrected. "**Fair"** surfaces should be repaired but are not yet considered to be a hazard; if not repaired, they should be monitored frequently. "**Good/intact"** surfaces should be monitored to ensure that they remain in a nonhazardous condition.

In addition, the presence of paint debris must be considered in evaluating condition. Given the variety of paint uses, there are many applications that can have a tendency for the paint to "wear" from the surface slowly, over an extended period of time. Conditions where paint has worn from a surface are worth noting for maintenance discussions (i.e., related to re-coating the surface should, for example, the coating provide weather protection), however, in the absence of loose paint chip debris/dust, such conditions would not represent a potential exposure situation related to lead.

The condition evaluation criteria for LCPs are summarized in Table A.1, below.

Table A.1 Lead-Containing Paint Condition Categories

Type of Building Component[1]	Total Area of Deteriorated Paint on Each Component		
	Good/Intact	**Fair[2]**	**Poor[3]**
Exterior components with large surface areas	Entire surface is intact.	Less than or equal to 10 square feet	More than 10 square feet
Interior components with large surface areas (walls, ceilings, floors, doors	Entire surface is intact.	Less than or equal to 2 square feet	More than 2 square feet
Interior and exterior components with small surface areas (window sills, baseboards, soffits, trim)	Entire surface is intact.	Less than or equal to 10% of the total surface area of the component	More than 10% of the total surface area of the component

NOTES:

1 Building component in this table refers to each individual component or side of building, not the combined surface area of all similar components in a room (e.g., a wall with 1 square foot of deteriorated paint is in "fair" condition, even if the other three walls in a room are intact).

2 Surfaces in "fair" condition should be repaired and/or monitored but are not considered to be "lead-containing paint hazards".

3 Surfaces in "poor" condition are considered to be "lead-containing paint hazards" and should be addressed through abatement or interim controls.

A.3 POLYCHLORINATED BIPHENYLS (PCBS)

PCBs are man-made toxic chemicals whose physical and chemical properties produce the following attributes: fire resistance, low electrical conductivity, high resistance to thermal breakdown, high chemical stability and resistance to oxidants and other chemical.

PCBs were used widely as coolants and lubricants in transformers, capacitors, and other electrical equipment. In fluorescent fixtures, PCBs were usually found within the small capacitors inside the ballast that controls the lamp. Although the use of PCBs in the manufacture of electrical equipment was banned in 1980, socks of items such as ballasts containing PCBs may have been used into the mid-1980s, or later, depending on the location and age of the stock used.

A.3.1 Health Effects

PCBs are insoluble in water; however, they readily dissolve in fats and other organic compounds. It is these attributes and fat-solubility that allow PCBs to persist in the environment and bio-accumulate in humans and animals. Exposure to PCBs can affect the immune system, reproductive system, nervous system and endocrine system. In humans, PCBs are potentially cancer-causing.

A.3.2 Regulatory Framework

The Federal Chlorobiphenyls Regulation, SOR/91-152, prohibited the use of PCBs in electrical equipment manufactured after July 1, 1980.

As of September 5, 2008, under subsection 93(1) of the Canadian *Environmental Protection Act,* (CEPA), Federal PCB regulations were published by the Canada Gazette Part II (SOR/2008-273) that imposed specific deadlines for the elimination of all PCBs in concentrations at or above 50 milligrams/kilogram (mg/kg). This regulation required the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limited the period of time PCB materials could be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (i.e., those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

Under SOR/2008-273, the following end-of-use dates were established:

- December 31, 2009
  - Equipment containing PCBs in a concentration of 500 mg/kg or more.
  - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in sensitive locations (i.e., drinking-water treatment plant, food or feed processing plant, child care facility, preschool, primary or secondary school, hospital, or senior citizen care facility or the property on which the plant or facility is located, within 100 m of it).
- December 31, 2014
  - Certain specified equipment not replaced by the 2009 deadline due to technical constraints for engineered-to-order equipment or if the facility is scheduled for permanent closure before 2014.
- December 31, 2025
  - Equipment containing PCBs in a concentration of at least 50 mg/kg but less than 500 mg/kg when located in non-sensitive locations.

In addition to the above, a maximum storage period of one year is allowed for PCBs and products that contain PCBs at each of the following non-sensitive locations:

- owner's PCB storage site
- PCB storage site of an authorized facility for decontamination or of an authorized transfer site
- PCB storage site of an authorized destruction facility

- Disposal of PCB waste is governed by the *Guideline for Hazardous Waste Management* (current version)
- Federal Transportation of Dangerous Goods Regulation set out the requirements for the proper transport of PCB waste in the Northwest Territories

A.4 MOULD

Mould can be found everywhere in the outside environment—on plants, in soil and on dead and decaying matter (i.e., dead leaves). Mould requires two main conditions in order to grow—a source of food (a substrate typically comprised of cellulose) and water. Sources of food for mould are plentiful in outdoor and indoor environments; however, it is the presence of water in an indoor environment that will determine mould growth. The source of water can be a result of a water pipe leak or even excess condensation. Thus, the key to controlling mould indoors is to control the presence of water.

The removal of building materials impacted by mould growth may require workers with specific training and experience using work procedures that have been developed to protect workers and work areas from exposure to elevated concentrations of airborne mould.

A.4.1 Health Effects

There are a number of documented cases of health problems related to exposure to indoor fungi. Both high-level, short-term exposures and lower-level, long-term exposures can result in illness. The most common symptoms from exposure to mould in indoor environments are runny nose, eye irritation, cough, congestion, aggravation of asthma, headache, flu-like symptoms, fatigue, and skin rash. People with suppressed immune systems may be susceptible to fungal infections as a result of exposure to indoor moulds.

People who are exposed to mould growth on building materials will not necessarily exhibit adverse health effects. However, the mould must still be removed. Humans are at risk from indoor mould when fungal spores, fragments or metabolites are released into the air and inhaled or physically contacted (dermal exposure).

Not everyone experiences allergic reaction; the susceptibility to exposure varies with the individual's genetic predisposition, age, state of health, and concurrent exposures. For these reasons, and because the measurement of exposure is not standardized and biological markers of exposure to fungi are largely unknown, it is not possible to establish "safe" or "unsafe" levels of exposure. However, federal and provincial policies have been written to minimize mould exposure and the elimination of mould indoors.

People's reaction to mould exposure is quite varied, and although anyone can be affected, some people may be more susceptible and at greater risk, including:

- infants and children
- elderly

- pregnant women
- individuals with respiratory conditions or allergies and asthma
- persons with weakened immune system (e.g., chemotherapy patients, organ or bone marrow transplant recipients, and people with HIV infections or autoimmune diseases)

People with specific health concerns should consult their doctor if concerned about mould exposure. Symptoms that may appear to stem from mould exposure may be due to other causes such as bacterial or viral infections or other allergies.

A.4.2 Regulatory Framework

At present, there are no specific laws or regulations governing acceptable levels of mould in buildings. The lack of specific regulatory standards is due in part to an inability to establish exposure-response relationships. Variation in individual susceptibility, limitations in sampling and analytical techniques, and the vast number of fungal agents and their products make it difficult to establish safe levels of exposure for all individuals. With a lack of defined exposure criteria, current Health Canada and other agency guidelines on the assessment and control of mould contamination in public buildings are largely based on prudent avoidance (i.e., remove any indoor growth or amplification site of mould, regardless of the concentration of moulds or their products in the indoor environment).

Although there are currently no regulations in Canada pertaining specifically to mould in buildings, occupational health and safety regulations typically require employers to take every precaution reasonable in the circumstances for the protection of workers.

Several additional guidelines and other resources describe procedures for the investigation and remediation of mould. The following documents indicate that mould observed in occupied building should be remediated in accordance with these procedures:

- Environmental Abatement Council of Ontario's (EACO) *Mould Abatement Guidelines*, 2010—Edition 2
- *Mould Guidelines for The Canadian Construction Industry*, Canadian Construction Association—82, 2004
- *Bioaerosols: Assessment and Control,* ACGIH 1999
- *Fungal Contamination in Public Buildings: Health Effects and Investigation Methods*, Federal-Provincial Committee on Environmental and Occupational Health 2004
- *Field Guide for the Determination of Biological Contaminants in Environmental Samples*, AIHA 1996
- *Clean-Up Procedures for Mould in Houses,* Canada Mortgage and Housing Corporation (CMHC) 2004

A.5 MERCURY

Mercury is commonly found in buildings as mercury vapour lighting, thermostats/thermometers with mercury-containing glass ampoules, electrical switches and can also be found in minor amounts in fluorescent lamp tubes and vapour bulbs and may be present in stable forms in adhesives. If mercury is exposed to the air, odourless vapours are formed.

A.5.1 Health Effects

Routes of exposure for mercury and mercury compounds include inhalation, ingestion, skin and/or eye contact. Mercury is hazardous if it is inhaled or absorbed through the skin, therefore exposure controls (including both respiratory protection and skin protection) are important to consider.

Elemental (metallic) mercury most often causes health effects through inhalation of its vapour, which can be absorbed through the lungs. This kind of exposure can result when elemental mercury is spilled (or products that contain elemental mercury break) and the mercury is exposed to the air. Vapour concentrations can vary especially in warm or poorly-ventilated indoor spaces where the airborne concentration can exceed the permissible exposure limit (provincially set).

Chronic mercury “poisoning” can be caused by long-term exposure to low airborne concentrations (or low levels) of mercury. Symptoms or effects of mercury exposure include: tremors, emotional changes (e.g., mood swings, nervousness, irritability, etc.), neuromuscular effects (e.g., muscular weakness, twitching), mental changes/disturbances, digestive disturbances, headaches, insomnia, and changes in nervous response.

Factors that determine the severity of the health effects from mercury exposure include the following:

- chemical form of mercury (e.g., elemental, methylmercury, inorganic and organic)
- dose
- age of individual exposed
- duration of exposure
- route of exposure—as listed above
- health of individual exposed

A.5.2 Regulatory Framework

In Canada, the Surface Coating Materials Regulations (SOR/2016-193) under the federal *Hazardous Products Act* provides a concentration of mercury that must not be exceeded in surface coatings that are presently sold in this country. This value was set at 10 ppm in 2005, and has remained at that value through the current iteration of that regulation. However, it is important to note that there is not a direct correlation between the concentration of mercury in a material to the potential occupational exposure if the material is disturbed.

Exposure to mercury is regulated by the NWT OHS Reg. The regulated occupational exposure limit for airborne mercury is 0.025 mg/m^3 (eight-hour TWA).

Mercury disposal should be through a scrap dealer (elemental mercury), recycling firm for mercury vapour and returned to the manufacturer for light tubes and fixtures. Disposal of mercury waste is governed by the Government of the Northwest Territories *Guideline for Hazardous Waste Management* (current version).

The Federal Transportation of Dangerous Goods Regulation and BC Reg. 63/88 set out the requirements for the proper transport of mercury waste in the Northwest Territories.

A.6 OZONE-DEPLETING SUBSTANCES

Ozone-depleting substances (ODSs) are chemical agents known as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) used in various refrigeration equipment including air-conditioning, heat pump, refrigeration or freezer units. They have also been used in solvents, as aerosol additives in the production of foam insulation and in fire extinguishing equipment.

A.6.1 Health Effects

Health effects are not typically related to exposure to ODSs directly, but to the consequences of ODS release to the atmosphere, subsequent degradation of the earth's ozone layer, and implications associated with increased UVB light exposure.

A.6.2 Regulatory Framework

ODSs are regulated in the Northwest Territories by the Government of the Northwest Territories *Environmental Guideline for Ozone Depleting Substances (ODS's) and Halocarbon Alternatives* (2007).

On federal land, aboriginal land and federal works, buildings and undertakings, Federal Halocarbon Regulation 2003 (SOR/2003-289) applies. All other buildings and uses of refrigerants and other agents are under the Ozone-Depleting Substances Regulations 1998 (SOR/99-7), under CEPA. The regulations prohibit the release of halocarbons contained in refrigeration systems, air conditioning systems, fire extinguishers (except to fight a fire that is not a fire caused for training purposes) or containers or equipment used in the re-use, recycling, reclamation or storage of a halocarbon.

The regulations also impose restrictions on the servicing and dismantling, disposing of or decommissioning of any system containing halocarbons and requires the recovery of halocarbons into an appropriate container by a certified individual. The regulation also details an owner's record-keeping obligations.

If ODS-containing materials are to be removed and disposed of, all ODSs must be handled, recycled, stored, and/or disposed of in accordance with the requirements of the Government of the Northwest Territories *Environmental Guideline for Ozone Depleting Substances* (ODS's) *and Halocarbon Alternatives* (2007).

The Federal Transportation of Dangerous Goods Regulation set out the requirements for the proper transport of ODS waste in the Northwest Territories.

A.7 SILICA

Silica is a scientific name that refers to a mineral group made up of silicon and oxygen. It is the crystalline form of silica that is of concern when considering health effects. Crystalline silica occurs in several forms including quartz, cristobalite and tridymite. Silica's many uses include sand in golf courses and playgrounds, sandblasting abrasives, glass, ceramics, building materials (concrete, grout, bricks, blocks, asphalt, acoustical tiles, floor tiles, plaster and numerous other materials), electronic components.

Dust containing respirable crystalline silica is produced during construction-related activities such as the following:

- demolition
- masonry, bricklaying and/or stone setting
- rock drilling
- repair and/or finishing of concrete materials
- abrasive blasting
- dry sweeping
- quarrying and mining

A.7.1 Health Effects

Crystalline silica dust particles, which are small enough to be inhaled into the lungs (respirable size), can cause a number of health problems. As with asbestos, silica within building materials poses no threat to human health if left undisturbed.

Exposure to crystalline silica airborne dust my cause scaring of the lungs with coughing and shortness of breath—also known as "silicosis", a form of disabling, progressive, and sometimes fatal pulmonary fibrosis.

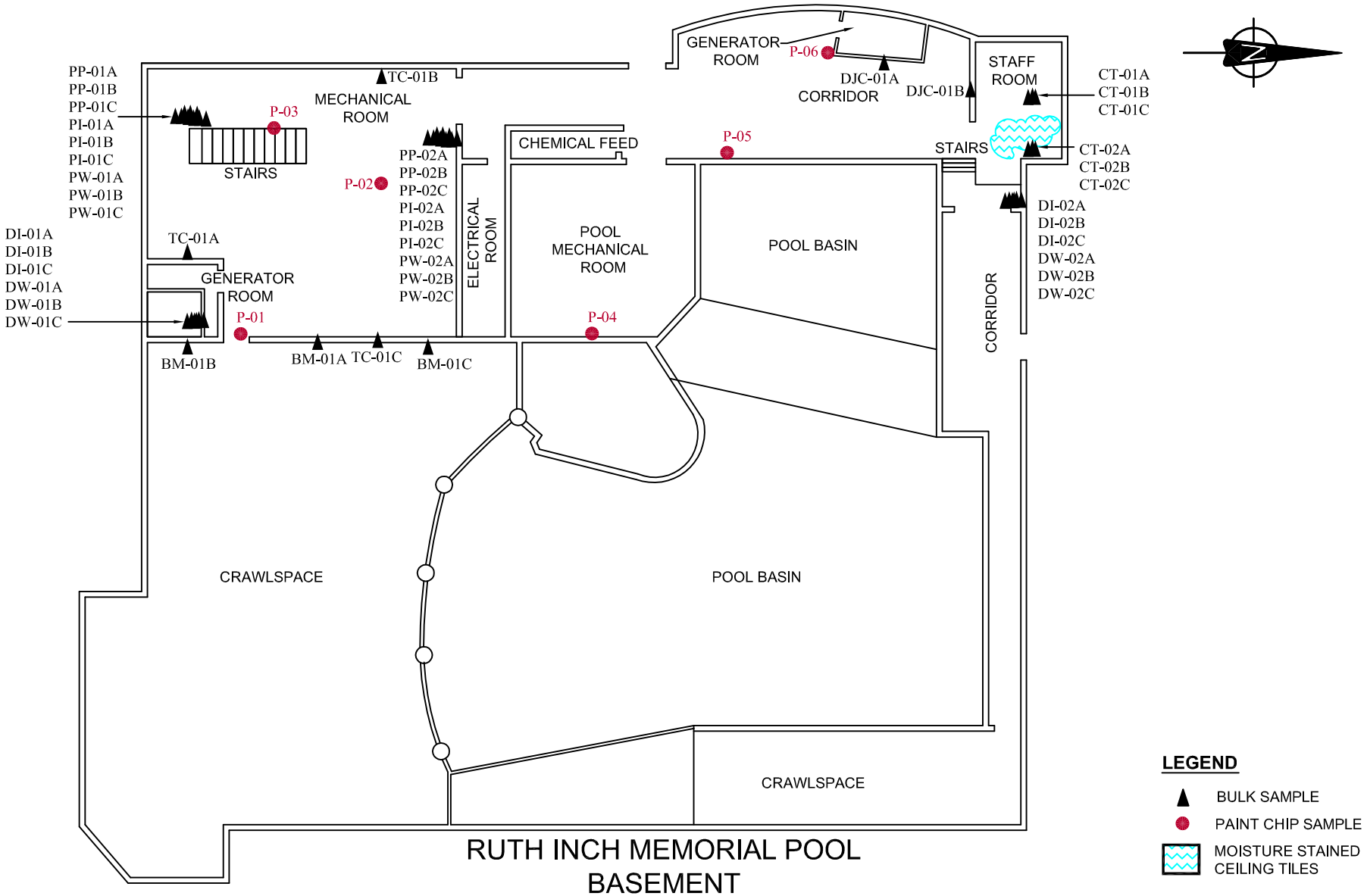
A.7.2 Regulatory Framework

Regulations pertaining to silica are provided in the NWT OHS Reg. Included are general provisions (minimizing release; keeping worksite clear of unnecessary accumulations; ensuring methods for decontamination prevent generation of airborne silica), provisions for "restricted areas" (where there is a reasonable chance that the airborne concentration of silica exceeds or may exceed the occupational exposure limit), provisions for use in abrasive blasting, and provisions for health assessments for workers exposed to silica.

The NWT OHS Reg. also establishes the eight-hour OEL for silica to be 0.05 mg/m^3 for each cristobalite and quartz.

APPENDIX B

Floor Plans



RUTH INCH MEMORIAL POOL
BASEMENT

LEGEND

- BULK SAMPLE
- PAINT CHIP SAMPLE
- MOISTURE STAINED CEILING TILES

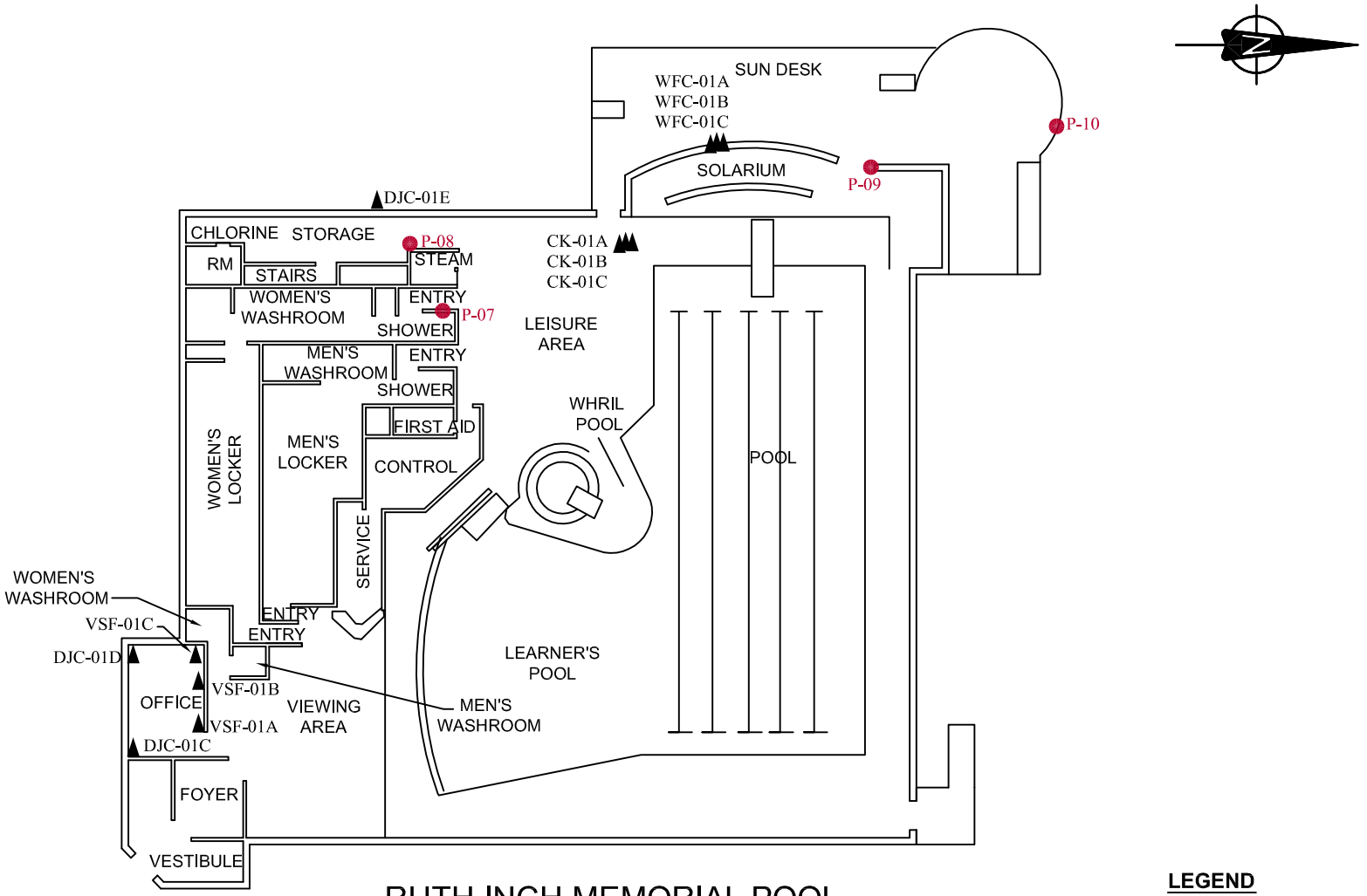
NOTES:
1. **ASBESTOS CONTAINING VERMICULITE INSULATION MAY BE PRESENT WITHIN BLOCK WALLS THROUGHOUT (DESTRUCTIVE TESTING REQUIRED TO CONFIRM PRESENCE).**
2. **BRICK MORTAR ASSOCIATED WITH WHITE 8"X8" BLOCK WALLS THROUGHOUT IS POTENTIALLY ASBESTOS CONTAINING (DESTRUCTIVE TESTING REQUIRED).**
3. **PRODUCTS ASSOCIATED WITH CERAMIC TILES (E.G. GROUT AND ADHESIVE) THROUGHOUT ARE POTENTIALLY ASBESTOS CONTAINING (DESTRUCTIVE TESTING REQUIRED).**
4. THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

FLOOR PLAN SHOWING LOCATIONS OF SAMPLES AND IDENTIFIED HAZARDOUS BUILDING MATERIALS

RUTH INCH MEMORIAL POOL, 6002 FRANKLIN AVE, YELLOWKNIFE, NWT

Client:	KPMG
Project No.:	123222072.000
Scale:	N.T.S.
Date:	22/06/23
Dwn. By:	CD SL2022060046 DM/CS
App'd By:	SG
Dwg. No.:	1

Stantec



RUTH INCH MEMORIAL POOL
MAIN FLOOR

LEGEND

- ▲ BULK SAMPLE
- ● PAINT CHIP SAMPLE

NOTES:
1. **ASBESTOS CONTAINING VERMICULITE INSULATION MAY BE PRESENT WITHIN BLOCK WALLS THROUGHOUT (DESTRUCTIVE TESTING REQUIRED TO CONFIRM PRESENCE).**
2. **BRICK MORTAR ASSOCIATED WITH WHITE 8"X8" BLOCK WALLS THROUGHOUT IS POTENTIALLY ASBESTOS CONTAINING (DESTRUCTIVE TESTING REQUIRED).**
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FLOOR PLAN SHOWING LOCATIONS OF SAMPLES AND IDENTIFIED HAZARDOUS BUILDING MATERIALS

RUTH INCH MEMORIAL POOL, 6002 FRANKLIN AVENUE, YELLOWKNIFE, NWT

Client:	KPMG
Project No.:	123222072.000
Scale:	N.T.S.
Date:	22/06/23
Dwn. By:	CD SL2022060047 DM/CS
App'd By:	SG
Dwg. No.:	2

Stantec

APPENDIX C

Summary of Results: Analysis of Bulk Samples for Asbestos

Appendix C SUMMARY OF RESULTS: ANALYSIS OF BULK SAMPLES FOR ASBESTOS

Table C.1 Suspected ACM Bulk Sample and Analytical Results Summary
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Texture coat – white, applied to walls throughout basement	TC-01A	Basement, adjacent to generator room	None Detected
	TC-01B	Basement, adjacent to mechanical room	None Detected
	TC-01C	Basemen, adjacent to crawlspace	None Detected
Pipe wrap – white, applied to insulated pipes throughout basement, on top of PI-01	PW-01A	Basement, mechanical room	None Detected
	PW-01B	Basement, mechanical room	None Detected
	PW-01C	Basement, mechanical room	None Detected
Pipe insulation – tan, pipe insulation applied to pipes throughout basement, under PW-01	PI-01A	Basement, mechanical room	None Detected
	PI-01B	Basement, mechanical room	None Detected
	PI-01C	Basement, mechanical room	None Detected
Pipe parging – white, applied to elbows and connections on insulated pipes throughout basement	PP-01A	Basement, mechanical room	None Detected
	PP-01B	Basement, mechanical room	None Detected
	PP-01C	Basement, mechanical room	None Detected
Pipe wrap – white, applied to boiler pipes in basement, on top of PI-02	PW-02A	Basement, mechanical room	None Detected
	PW-02B	Basement, mechanical room	None Detected
	PW-02C	Basement, mechanical room	None Detected
Pipe insulation – tan, applied to boiler pipes in basement, under PW-02	PI-02A	Basement, mechanical room	None Detected
	PI-02B	Basement, mechanical room	None Detected
	PI-02C	Basement, mechanical room	None Detected
Pipe parging – white, applied to elbows on boiler pipes	PP-02A	Basement, mechanical room	None Detected
	PP-02B	Basement, mechanical room	None Detected
	PP-02C	Basement, mechanical room	None Detected
Duct wrap – white, applied to emergency generator duct in basement, on top of DI-01	DW-01A	Basement, generator room	None Detected
	DW-01B	Basement, generator room	None Detected
	DW-01C	Basement, generator room	None Detected
Duct insulation – tan, applied to emergency generator duct in basement, under DW-01	DI-01A	Basement, generator room	None Detected
	DI-01B	Basement, generator room	None Detected
	DI-01C	Basement, generator room	None Detected

Table C.1 Suspected ACM Bulk Sample and Analytical Results Summary
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

Material/Homogenous Application Description	Sample Number	Sample Location	Result (% Asbestos)
Brick mortar – grey, applied to block walls in basement crawlspace	BM-01A	Basement, crawlspace	None Detected
	BM-01B	Basement, crawlspace	None Detected
	BM-01C	Basement, crawlspace	None Detected
Drywall joint compound – white, applied to walls throughout	DJC-01A	Basement, corridor, adjacent to generator room	None Detected
	DJC-01B	Basement, adjacent to staff room	None Detected
	DJC-01C	Main floor, pool office	None Detected
	DJC-01D	Main floor, pool office	None Detected
	DJC-01E	Main floor, storage	None Detected
Ceiling tiles – white, 2x4', applied to ceilings in basement staff room	CT-01A	Basement, staff room	None Detected
	CT-01B	Basement, staff room	None Detected
	CT-01C	Basement, staff room	None Detected
Ceiling tiles, white with holes, 2x4', applied to ceilings in basement staff room	CT-02A	Basement, staff room	None Detected
	CT-02B	Basement, staff room	None Detected
	CT-02C	Basement, staff room	None Detected
Duct wrap – beige, applied to basement exhaust fan duct, on top of DI-02	DW-02A	Basement, janitorial storage corridor	None Detected
	DW-02B	Basement, janitorial storage corridor	None Detected
	DW-02C	Basement, janitorial storage corridor	None Detected
Duct insulation – tan, applied to basement exhaust fan duct, under DW-02	DI-02A	Basement, janitorial storage corridor	None Detected
	DI-02B	Basement, janitorial storage corridor	None Detected
	DI-02C	Basement, janitorial storage corridor	None Detected
Caulking – white, applied to pool deck floor	CK-01A	Main floor, pool deck, adjacent to solarium	None Detected
	CK-01B	Main floor, pool deck, adjacent to solarium	None Detected
	CK-01C	Main floor, pool deck, adjacent to solarium	None Detected
Vinyl sheet flooring – grey, applied to floor in main floor pool office	VSF-01A	Main floor, pool office	None Detected
	VSF-01B	Main floor, pool office	None Detected
	VSF-01C	Main floor, pool office	None Detected
Window frame caulking - grey, applied to windows throughout exterior	WFC-01A	Exterior, sun deck	None Detected
	WFC-01B	Exterior, sun deck	None Detected
	WFC-01C	Exterior, sun deck	None Detected

NOTES:
1. Bold, highlighted text indicates confirmed ACM
2. Discrepancies between sampled material or location descriptions between this table and the laboratory certificate – this table is to be considered correct

APPENDIX D

Laboratory Analytical Report—Asbestos: Polarized Light Microscopy

EMSL Canada Inc.

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http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 692201571
Customer ID: 55JACQ30L
Customer PO: 123222072
Project ID:

Attn: Sabrina Guglielmi
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Collected: 5/18/2022
Received: 5/25/2022
Analyzed: 6/01/2022

Proj: 123222072/CITY OF YELLOWKNIFE, RUTH INCH POOL

Test Report: Asbestos Analysis of Bulk Materials for Northwest Territories Regulation 039-2015 via EPA600/R-93/116 Method

Client Sample ID: TC-01A ***Lab Sample ID:*** **692201571-0001**

Sample Description: Basement, adjacent to generator room/Texture coat – white, applied to walls throughout basement

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: TC-01B ***Lab Sample ID:*** **692201571-0002**

Sample Description: Basement, adjacent to mechanical room/Texture coat – white, applied to walls throughout basement

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: TC-01C ***Lab Sample ID:*** **692201571-0003**

Sample Description: Basemen, adjacent to crawlspace /Texture coat – white, applied to walls throughout basement

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: PW-01A ***Lab Sample ID:*** **692201571-0004**

Sample Description: Basement, mechanical room/Pipe wrap – white, applied to insulated pipes throughout basement, on top of PI-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	55.0%	45.0%	None Detected	

Client Sample ID: PW-01B ***Lab Sample ID:*** **692201571-0005**

Sample Description: Basement, mechanical room/Pipe wrap – white, applied to insulated pipes throughout basement, on top of PI-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	55.0%	45.0%	None Detected	

Client Sample ID: PW-01C ***Lab Sample ID:*** **692201571-0006**

Sample Description: Basement, mechanical room/Pipe wrap – white, applied to insulated pipes throughout basement, on top of PI-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	White	60.0%	40.0%	None Detected	

Client Sample ID: PI-01A ***Lab Sample ID:*** **692201571-0007**

Sample Description: Basement, mechanical room/Pipe insulation – tan, pipe insulation applied to pipes throughout basement, under PW-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Yellow	95.0%	5.0%	None Detected	

EMSL Canada Inc.

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Phone/Fax: (604) 757-3158 / (604) 757-4731
http://www.EMSL.com / vancouverlab@EMSL.com

EMSL Canada Order 692201571
Customer ID: 55JACQ30L
Customer PO: 123222072
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Northwest Territories Regulation 039-2015 via EPA600/R-93/116 Method

Client Sample ID: PI-01B **Lab Sample ID:** **692201571-0008**

Sample Description: Basement, mechanical room/Pipe insulation – tan, pipe insulation applied to pipes throughout basement, under PW-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: PI-01C **Lab Sample ID:** **692201571-0009**

Sample Description: Basement, mechanical room/Pipe insulation – tan, pipe insulation applied to pipes throughout basement, under PW-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Yellow	100.0%	0.0%	None Detected	

Client Sample ID: PP-01A **Lab Sample ID:** **692201571-0010**

Sample Description: Basement, mechanical room/Pipe parging – white, applied to elbows and connections on insulated pipes throughout basement

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Gray	35.0%	65.0%	None Detected	

Client Sample ID: PP-01B **Lab Sample ID:** **692201571-0011**

Sample Description: Basement, mechanical room/Pipe parging – white, applied to elbows and connections on insulated pipes throughout basement

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Gray	30.0%	70.0%	None Detected	

Client Sample ID: PP-01C **Lab Sample ID:** **692201571-0012**

Sample Description: Basement, mechanical room/Pipe parging – white, applied to elbows and connections on insulated pipes throughout basement

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	White	15.0%	85.0%	None Detected	

Client Sample ID: PW-02A **Lab Sample ID:** **692201571-0013**

Sample Description: Basement, mechanical room/Pipe wrap – white, applied to boiler pipes in basement, on top of PI-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	70.0%	30.0%	None Detected	

Client Sample ID: PW-02B **Lab Sample ID:** **692201571-0014**

Sample Description: Basement, mechanical room/Pipe wrap – white, applied to boiler pipes in basement, on top of PI-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	70.0%	30.0%	None Detected	

Client Sample ID: PW-02C **Lab Sample ID:** **692201571-0015**

Sample Description: Basement, mechanical room/Pipe wrap – white, applied to boiler pipes in basement, on top of PI-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Gray	60.0%	40.0%	None Detected	

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Project ID:

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Client Sample ID: PI-02A **Lab Sample ID:** **692201571-0016**

Sample Description: Basement, mechanical room/Pipe insulation – tan, applied to boiler pipes in basement, under PW-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: PI-02B **Lab Sample ID:** **692201571-0017**

Sample Description: Basement, mechanical room/Pipe insulation – tan, applied to boiler pipes in basement, under PW-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: PI-02C **Lab Sample ID:** **692201571-0018**

Sample Description: Basement, mechanical room/Pipe insulation – tan, applied to boiler pipes in basement, under PW-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Yellow	100.0%	0.0%	None Detected	

Client Sample ID: PP-02A **Lab Sample ID:** **692201571-0019**

Sample Description: Basement, mechanical room/Pipe parging – white, applied to elbows on boiler pipes

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Gray	25.0%	75.0%	None Detected	

Client Sample ID: PP-02B **Lab Sample ID:** **692201571-0020**

Sample Description: Basement, mechanical room/Pipe parging – white, applied to elbows on boiler pipes

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Gray	25.0%	75.0%	None Detected	

Client Sample ID: PP-02C **Lab Sample ID:** **692201571-0021**

Sample Description: Basement, mechanical room/Pipe parging – white, applied to elbows on boiler pipes

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Gray	30.0%	70.0%	None Detected	

Client Sample ID: DW-01A **Lab Sample ID:** **692201571-0022**

Sample Description: Basement, generator room /Duct wrap – white, applied to emergency generator duct in basement, on top of DI-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Beige	60.0%	40.0%	None Detected	

Client Sample ID: DW-01B **Lab Sample ID:** **692201571-0023**

Sample Description: Basement, generator room /Duct wrap – white, applied to emergency generator duct in basement, on top of DI-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Beige	60.0%	40.0%	None Detected	

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Client Sample ID: DW-01C **Lab Sample ID:** **692201571-0024**

Sample Description: Basement, generator room /Duct wrap – white, applied to emergency generator duct in basement, on top of DI-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Beige	80.0%	20.0%	None Detected	

Client Sample ID: DI-01A **Lab Sample ID:** **692201571-0025**

Sample Description: Basement, generator room /Duct insulation – tan, applied to emergency generator duct in basement, under DW-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: DI-01B **Lab Sample ID:** **692201571-0026**

Sample Description: Basement, generator room /Duct insulation – tan, applied to emergency generator duct in basement, under DW-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Yellow	95.0%	5.0%	None Detected	

Client Sample ID: DI-01C **Lab Sample ID:** **692201571-0027**

Sample Description: Basement, generator room /Duct insulation – tan, applied to emergency generator duct in basement, under DW-01

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Yellow	100.0%	0.0%	None Detected	

Client Sample ID: BM-01A **Lab Sample ID:** **692201571-0028**

Sample Description: Basement, crawlspace /Brick mortar – grey, applied to block walls in basement crawlspace

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Gray	0.0%	100.0%	None Detected	

Client Sample ID: BM-01B **Lab Sample ID:** **692201571-0029**

Sample Description: Basement, crawlspace /Brick mortar – grey, applied to block walls in basement crawlspace

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Gray	0.0%	100.0%	None Detected	

Client Sample ID: BM-01C **Lab Sample ID:** **692201571-0030**

Sample Description: Basement, crawlspace /Brick mortar – grey, applied to block walls in basement crawlspace

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Gray	0.0%	100.0%	None Detected	

Client Sample ID: DJC-01A **Lab Sample ID:** **692201571-0031**

Sample Description: Basement, corridor, adjacent to generator room /Drywall joint compound – white, applied to walls throughout

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	0.0%	100.0%	None Detected	

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Customer PO: 123222072
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for Northwest Territories Regulation 039-2015 via EPA600/R-93/116 Method

Client Sample ID: DJC-01B **Lab Sample ID:** **692201571-0032**

Sample Description: Basement, adjacent to staff room/Drywall joint compound – white, applied to walls throughout

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: DJC-01C **Lab Sample ID:** **692201571-0033**

Sample Description: Main floor, pool office/Drywall joint compound – white, applied to walls throughout

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: DJC-01D **Lab Sample ID:** **692201571-0034**

Sample Description: Main floor, pool office/Drywall joint compound – white, applied to walls throughout

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: DJC-01E **Lab Sample ID:** **692201571-0035**

Sample Description: Main floor, storage /Drywall joint compound – white, applied to walls throughout

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	White	0.0%	100.0%	None Detected	

Client Sample ID: CT-01A **Lab Sample ID:** **692201571-0036**

Sample Description: Basement, staff room /Ceiling tiles – white, 2x4', applied to ceilings in basement staff room

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Tan	95.0%	5.0%	None Detected	

Client Sample ID: CT-01B **Lab Sample ID:** **692201571-0037**

Sample Description: Basement, staff room /Ceiling tiles – white, 2x4', applied to ceilings in basement staff room

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/30/2022	Tan	95.0%	5.0%	None Detected	

Client Sample ID: CT-01C **Lab Sample ID:** **692201571-0038**

Sample Description: Basement, staff room /Ceiling tiles – white, 2x4', applied to ceilings in basement staff room

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Brown	95.0%	5.0%	None Detected	

Client Sample ID: CT-02A **Lab Sample ID:** **692201571-0039**

Sample Description: Basement, staff room /Ceiling tiles, white with holes, 2x4', applied to ceilings in basement staff room

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Beige	65.0%	35.0%	None Detected	

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Client Sample ID: CT-02B **Lab Sample ID:** **692201571-0040**

Sample Description: Basement, staff room /Ceiling tiles, white with holes, 2x4', applied to ceilings in basement staff room

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Beige	65.0%	35.0%	None Detected	

Client Sample ID: CT-02C **Lab Sample ID:** **692201571-0041**

Sample Description: Basement, staff room /Ceiling tiles, white with holes, 2x4', applied to ceilings in basement staff room

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Gray	70.0%	30.0%	None Detected	

Client Sample ID: DW-02A **Lab Sample ID:** **692201571-0042**

Sample Description: Basement, janitorial storage corridor/Duct wrap – beige, applied to basement exhaust fan duct, on top of DI-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	White/Gold	0.0%	100.0%	None Detected	

Client Sample ID: DW-02B **Lab Sample ID:** **692201571-0043**

Sample Description: Basement, janitorial storage corridor/Duct wrap – beige, applied to basement exhaust fan duct, on top of DI-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Silver/Gold	0.0%	100.0%	None Detected	

Client Sample ID: DW-02C **Lab Sample ID:** **692201571-0044**

Sample Description: Basement, janitorial storage corridor/Duct wrap – beige, applied to basement exhaust fan duct, on top of DI-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Silver/Gold	0.0%	100.0%	None Detected	

Client Sample ID: DI-02A **Lab Sample ID:** **692201571-0045**

Sample Description: Basement, janitorial storage corridor/Duct insulation – tan, applied to basement exhaust fan duct, under DW-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Yellow	90.0%	10.0%	None Detected	

Client Sample ID: DI-02B **Lab Sample ID:** **692201571-0046**

Sample Description: Basement, janitorial storage corridor/Duct insulation – tan, applied to basement exhaust fan duct, under DW-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Yellow	90.0%	10.0%	None Detected	

Client Sample ID: DI-02C **Lab Sample ID:** **692201571-0047**

Sample Description: Basement, janitorial storage corridor/Duct insulation – tan, applied to basement exhaust fan duct, under DW-02

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Fibrous	Asbestos	Comment
PLM	5/31/2022	Yellow	100.0%	0.0%	None Detected	

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Client Sample ID: CK-01A ***Lab Sample ID:*** **692201571-0048**

Sample Description: Main floor, pool deck, adjacent to solarium /Caulking – white, applied to pool deck floor

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	White	0.0%	100%	None Detected	

Client Sample ID: CK-01B ***Lab Sample ID:*** **692201571-0049**

Sample Description: Main floor, pool deck, adjacent to solarium /Caulking – white, applied to pool deck floor

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	White	0.0%	100%	None Detected	

Client Sample ID: CK-01C ***Lab Sample ID:*** **692201571-0050**

Sample Description: Main floor, pool deck, adjacent to solarium /Caulking – white, applied to pool deck floor

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	White	0.0%	100%	None Detected	

Client Sample ID: VSF-01A ***Lab Sample ID:*** **692201571-0051**

Sample Description: Main floor, pool office/Vinyl sheet flooring – grey, applied to floor in main floor pool office

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	Gray/Beige	0.0%	100%	None Detected	

Client Sample ID: VSF-01B ***Lab Sample ID:*** **692201571-0052**

Sample Description: Main floor, pool office/Vinyl sheet flooring – grey, applied to floor in main floor pool office

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	Gray/Beige	0.0%	100%	None Detected	

Client Sample ID: VSF-01C ***Lab Sample ID:*** **692201571-0053**

Sample Description: Main floor, pool office/Vinyl sheet flooring – grey, applied to floor in main floor pool office

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	Gray/Beige	0.0%	100%	None Detected	

Client Sample ID: WFC-01A ***Lab Sample ID:*** **692201571-0054**

Sample Description: Exterior, sun deck /Window frame caulking - grey, applied to windows throughout exterior

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	Gray	0.0%	100%	None Detected	

Client Sample ID: WFC-01B ***Lab Sample ID:*** **692201571-0055**

Sample Description: Exterior, sun deck /Window frame caulking - grey, applied to windows throughout exterior

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	Gray	0.0%	100%	None Detected	

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Client Sample ID: WFC-01C ***Lab Sample ID:*** **692201571-0056**

Sample Description: Exterior, sun deck /Window frame caulking - grey, applied to windows throughout exterior

TEST	Analyzed Date	Color	Non-Asbestos Fibrous	Non-Asbestos Non-Fibrous	Asbestos	Comment
PLM Grav. Reduction	6/01/2022	Gray	0.0%	100%	None Detected	

Analyst(s):

Ana Antic	PLM (31) PLM Grav. Reduction (6)
Nicole Yeo	PLM Grav. Reduction (3)
Omid Ghayyur	PLM (16)

Reviewed and approved by:

Nicole Yeo, Laboratory Manager
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. Estimation of uncertainty available upon request. This report is a summary of multiple methods of analysis, fully compliant reports are available upon request. A combination of PLM and TEM analysis may be necessary to ensure consistently reliable detection of asbestos. This report must not be used to claim product endorsement by NVLAP of any agency or the U.S. Government.

Samples analyzed by EMSL Canada Inc. Burnaby, BC NVLAP Lab Code 201068-0

Initial report from: 06/01/202214:43:14

APPENDIX E

Summary of Identified Asbestos-Containing Materials

Appendix E SUMMARY OF IDENTIFIED ASBESTOS-CONTAINING MATERIALS

Table E.1 Summary of Identified Asbestos-Containing Materials
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

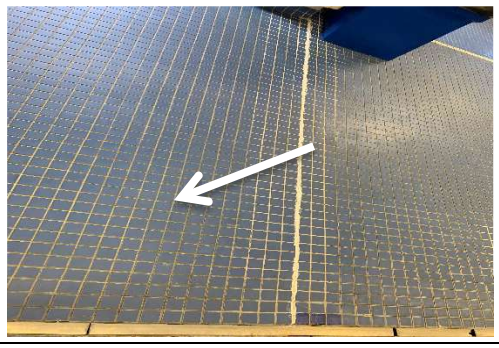
Identified ACM Description and Condition Information		
Products associated with white ceramic tiles (e.g. grout and adhesive) applied to pool deck floor		
% Type	PACM	
Friability	Non-friable	
Condition	Good	
Products associated with blue ceramic tiles (e.g. grout and adhesive) applied to pool deck floor		
% Type	PACM	
Friability	Non-friable	
Condition	Good	
Products associated with beige ceramic tiles (e.g. grout and adhesive) applied to walls throughout upper floor change rooms		
% Type	PACM	
Friability	Non-friable	
Condition	Good	

Table E.1 Summary of Identified Asbestos-Containing Materials
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

Identified ACM Description and Condition Information		
Products associated with grey ceramic tiles (e.g. grout and adhesive) throughout upper floor lobby		
% Type	PACM	
Friability	Non-friable	
Condition	Good	
Products associated with mosaic ceramic tiles (e.g. grout and adhesive) applied to walls throughout pool deck		
% Type	PACM	
Friability	Non-friable	
Condition	Good	
Brick mortar associated with white 8x8' block walls throughout upper floor changerooms		
% Type	PACM	
Friability	Non-friable	
Condition	Good	

Table E.1 Summary of Identified Asbestos-Containing Materials
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

Identified ACM Description and Condition Information		
Vermiculite insulation (if present) within block walls throughout		
% Type	PACM (destructive testing required to confirm presence/absence).	
Friability	Friable	
Condition	Good	

APPENDIX F

Summary of Results: Analysis of Paint Chip Samples for Lead

Appendix F SUMMARY OF RESULTS: ANALYSIS OF PAINT CHIP SAMPLES FOR LEAD

Table F.1 Suspected Lead-Containing Paint Sample and Analytical Results Summary Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

Sample Number	Paint Colour/Application	Sample Location	Result (ppm)
P-01	**Green on metal doors throughout**	**Basement, crawlspace entrance door**	**1,600**
P-02	Grey on concrete floors throughout	Basement, adjacent to mechanical room	<80
P-03	Yellow on texture coat throughout basement	Basement, adjacent to main stairwell	<80
P-04	Light blue on texture coat throughout pool mechanical room	Basement, pool mechanical room	<80
P-05	White on concrete walls throughout basement	Basement, corridor to staff room	<80
P-06	White on drywall walls throughout	Basement, generator room adjacent to laundry area	<80
P-07	White on masonry block walls throughout	Main floor, women's shower	<80
P-08	Grey paint on metal doors (on top of P-01) throughout	Main floor, door to storage room	<80
P-09	Beige on metal exterior walls throughout	Exterior, adjacent to solarium	170
P-10	**Red on metal railings and trim throughout exterior**	**Exterior, railing on balcony**	**2,200**

NOTE:
Bold, highlighted text indicates confirmed LCP

APPENDIX G

Laboratory Analytical Report—Lead: Paint Chip Analysis

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ProjectID:	

Attn: **Sabrina Guglielmi**
Stantec Consulting Ltd.
500 - 4730 Kingsway
Burnaby, BC V5H 0C6

Phone: (604) 412-3004
Fax:
Received: 5/26/2022 08:41 AM
Collected: 5/18/2022

Project: **123222072 / YELLOWKNIFE , RUTH INCH POOL**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	Lab ID	Collected	Analyzed	Weight	Lead Concentration
P-01	652204851-0001	5/18/2022	6/1/2022	0.2667 g	1600 ppm
	Site: BASEMENT , CRAWLSPACE ENTRANCE DOOR Desc: GREEN ON METAL DOORS THROUGHOUT				
P-02	652204851-0002	5/18/2022	6/1/2022	0.2614 g	<80 ppm
	Site: BASEMENT , ADJACENT TO MECHANICAL ROOM Desc: GREY ON CONCRETE FLOORS THROUGHOUT				
P-03	652204851-0003	5/18/2022	6/1/2022	0.2568 g	<80 ppm
	Site: BASEMENT , ADJACENT TO MAIN STAIRWELL Desc: YELLOW ON TEXTURE COAT THROUGHOUT BASEMENT				
P-04	652204851-0004	5/18/2022	6/1/2022	0.2547 g	<80 ppm
	Site: BASEMENT , POOL MECHANICAL ROOM Desc: LIGHT BLUE ON TEXTURE COAT THROUGHOUT POOL MECHANICAL ROOM				
P-05	652204851-0005	5/18/2022	6/1/2022	0.2521 g	<80 ppm
	Site: BASEMENT , CORRIDOR TO STAFF ROOM Desc: WHITE ON CONCRETE WALLS THROUGHOUT BASEMENT				
P-06	652204851-0006	5/18/2022	6/1/2022	0.2533 g	<80 ppm
	Site: BASEMENT , GENERATOR ROOM ADJACENT TO LAUNDRY AREA Desc: WHITE ON DRYWALL WALLS THROUGHOUT				
P-07	652204851-0007	5/18/2022	6/1/2022	0.2513 g	<80 ppm
	Site: MAIN FLOOR , WOMEN'S SHOWER Desc: WHITE ON MASONRY BLOCK WALLS THROUGHOUT				
P-08	652204851-0008	5/18/2022	6/1/2022	0.2530 g	<80 ppm
	Site: MAIN FLOOR , DOOR TO SORAGE ROOM Desc: GREY PAINT ON METAL DOORS (ON TOP OF P - 01) THROUGHOUT				
P-09	652204851-0009	5/18/2022	6/1/2022	0.1266 g	170 ppm
	Site: EXTERIOR , ADJACENT TO SOLARIUM Desc: BEIGE ON METAL EXTERIOR WALLS THROUGHOUT				
P-10	652204851-0010	5/18/2022	6/1/2022	0.2563 g	2200 ppm
	Site: EXTERIOR , RAILING ON BALCONY Desc: RED ON METAL RAILINGS AND TRIM THROUGHOUT EXTERIOR				

Jefferson Salvador, Laboratory Manager
or other approved signatory

Initial report from 06/01/2022 16:23:57

APPENDIX H

Summary of Identified LCPs

Appendix H SUMMARY OF IDENTIFIED LCPS

Table H.1 Summary of Identified LCPs
Ruth Inch Memorial Pool, 6002 Franklin Ave, Yellowknife, NWT

LCP Description		Photo
Paint colour	Green	
Substrate	Metal	
Location/approx. extent	Applied to doors throughout	
Lead content	1,600 ppm	
Condition	Good	
Paint colour	Red	
Substrate	Metal	
Location/approx. extent	Applied to railings and trim throughout exterior	
Lead content	2,200 ppm	
Condition	Good with localized damage (sundeck railing flaking and chipping in some sections)	