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INTRUSIVE DESIGNATED SUBSTANCES AND HAZARDOUS MATERIALS SURVEY OF CELL BLOCK No.1

CORRECTIONAL SERVICE OF CANADA, COLLINS BAY INSTITUTION, KINGSTON, ONTARIO

FINAL REPORT

Prepared for:
Public Works and Government Services Canada
and
Correctional Service of Canada

Prepared by:
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Ottawa, Ontario

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THIS REPORT CONTAINS PROVISIONS LIMITING LIABILITY, THE SCOPE OF THE REPORT AND THIRD PARTY RELIANCE.

EXECUTIVE SUMMARY

Aqua Terre Solutions Inc. (Aqua Terre) was retained by Public Works and Government Services Canada (PWGSC), on behalf of Correctional Service of Canada, to conduct an intrusive Designated Substances and Hazardous Materials Survey (DSHMS) of Cell Block No.1 (CBB1), at the Collins Bay Institution located at 1455 Bath Road, in the city of Kingston, Ontario.

Cell Block No. 1 was constructed in 1937 and renovated in 1973 and 1978. The building and property are currently owned and managed by Correctional Service of Canada. Although presently unoccupied, the building continues to be used for storage and is accessed by maintenance staff on a regular basis.

The designated substances surveyed were those designated under the Ontario Occupational Health and Safety Act and included (but were not limited to) asbestos, lead, mercury and silica. The hazardous materials surveyed included polychlorinated biphenyl (PCB) containing equipment, ozone-depleting substances (ODS), urea formaldehyde foam insulation (UFFI), fuel, oil and/or waste oil storage, chemical storage, radioactive materials, and mould.

A total of forty-one (41) building materials were identified and multiple samples of each material were collected for laboratory asbestos analysis. A total of twenty-three (23) building material samples were submitted for bulk asbestos analysis using the polarized light microscopy (PLM) method (resulting in 29 separate analyses). A total of eighteen (18) building material samples were submitted for asbestos analyses using the transmission electron microscopy (TEM) method (resulting in 16 separate analyses). In addition, fourteen (14) paint samples were submitted for laboratory analysis of lead.

The findings and recommendations for the 2007 Designated Substances and Hazardous Materials Survey conducted for Cell Block No.1 of the Collins Bay Institution follows.

Asbestos

The methodology used to assess the risk of exposure to building occupants was consistent with the PWGSC document entitled DM Directive 057- Asbestos Management (1997). Note that the building was not occupied by any inmates at the time of the inspection and there were no CSC personnel permanently occupying any space within the building. However, the building is used for storage and CSC personnel routinely access the building to bring/remove various items. Maintenance personnel

also access the building on a regular basis. Although the intent of this assessment was to satisfy the requirements of the Occupational Health and Safety Act (OHSA) with respect to contractor notification, the recommendations are also consistent with DM Directive 057 due to the occupancy issues noted above.

Asbestos in the form of pipe insulation (straight lengths, elbows), and vinyl floor tiles was identified in CBB1. Since CBB1 is scheduled for demolition, Action 3 removal is recommended regardless of accessibility/condition for all types of ACM. Estimated costs to remove all ACM in CBB1 is approximately $95,000.

Disturbance (including removal) of confirmed or suspected ACMs (whether friable or non-friable) must be conducted in accordance with O. Reg. 838 (as amended by O. Reg. 278/05), which outlines standard practices involving the handling of asbestos-containing materials (Type 1, 2, or 3). Appropriate respiratory protection and ventilation must be utilized during demolition or modification of any asbestos-containing materials in accordance with this regulation. Disposal of ACMs should be performed in accordance with O. Reg. 347 (e.g. segregation of asbestos-containing waste, labelling of waste, disposal at a licensed waste disposal facility, etc.). The following table provides a summary of where asbestos was identified throughout CBB1, the amount of ACM identified, and the specific recommended mitigation type for removal.

Summary of Asbestos Findings

Building Level	Room	Type of ACM	Amount of ACM	Mitigation Type (1, 2 or 3)[1]
Basement	Service Tunnel	Aircell Insulation around piping (3" to 6" in diameter)	14 m	3
First Floor	Office, Room 104	Pipe Insulation	19 m	3
First Floor	Office, Room 104	Pipe Elbow Insulation	1	2
First Floor	Service corridor	Aircell Insulation around piping (4" in diameter)	10 m	3
First Floor	101-104, 107, 109, A3-A17, A20-A27, A29-A35, B4-B17, B19-B24, B26-B28, B30-B35	Vinyl floor tiles, 12" x 12"	807 m^2	3

Building Level	Room	Type of ACM	Amount of ACM	Mitigation Type (1, 2 or 3)[1]
Second Floor	Service corridor	Aircell Insulation around piping (4" in diameter)	1.5 m	3
Second Floor	C3-C16, C18-C35, D3-D10, D12-D29, D31-D35	Vinyl floor tiles, 12" x 12"	319 m^2	3

[1] Type 1, 2 and 3 work is described in section 2.3.1.

Should CSC decide not to demolish CBB1 it is recommended that an Asbestos Management Plan be prepared for the building. As an interim measure, given the presence of exposed, friable asbestos in the Service Tunnel (basement) and the Service Corridors (Rooms 108 and 201), access to these areas should be restricted by isolating them from the remainder of the building. This could be readily achieved by locking the doors at either end of the Service Corridor (Room 108) and the easternmost door of Room 201 (Range "C" - Catwalk). Warning signs should be posted at each door indicating the presence of exposed asbestos. Personnel requiring access to these areas would need to be made aware of the presence of asbestos and be trained in accordance with O. Reg. 278/05.

Lead

Lead-based paint was identified throughout Cell Block No.1. The overall condition of the majority of the painted areas was good to fair.

There is no regulatory requirement to remove lead-based paint. When completing demolition in areas with lead-based paint, work should be conducted in accordance with O. Reg. 843 (as amended by O. Reg. 109/04) (e.g. implementation of an effective Lead Control Program which details engineering controls during removal (e.g. isolation of work area, dust control measures, containment of wash water, proper ventilation, proper hygiene practices and use of personal protective equipment, etc.). Wastes generated should be managed in accordance with O.Reg. 347 as amended.

The following table provides a summary of areas of lead-based paint identified in Cell Block No.1.

Summary of Lead-Based Paint

Building Level	Room	Location and Description	Condition	Lead Content (ppm)	Estimated Quantity (m^2)
First Floor	101-103, 105, 107, 109, 110, 112, A3	Light blue grey paint on plastered walls and/or ceiling	Fair	45300	1504
First Floor	101, 107, 109, B31, B33, B34	Teal paint on radiators, plastered walls and ceiling, stairs to second floor	Good	1310	163
First Floor	101, 107, 109, B33, B34	Burgundy paint on plaster walls and ceiling and stairs	Good	2100	125
First Floor	101, 110, 112, A3-A35, B3-B35	Dark blue grey paint on trim and cell walls and bars	Good	3560	73
Second Floor	203, 205, 206, C3-C35, D3-D35	Light blue grey paint on plastered walls and/or ceiling	Good	45300	1447
Second Floor	206	Teal paint on plastered walls and ceiling, trim, and the roof of room 102	Good	1310	10
Second Floor	206	Burgundy paint on plaster walls and ceiling, and trim, and the roof of room 103	Good	2100	11
Second Floor	203, 205, 206, C3-C35, D3-D35	Dark blue grey paint on cell walls and bars	Good	3560	70
Second Floor	C26, C29	Black paint on tiles and cell walls	Good	2400	8

Cast iron pipe flanges likely containing leaded packing material are present throughout the main building. A total of approximately 1132 pipe flanges were observed throughout the main building. Lead-containing batteries may be present in emergency lighting packs. A total of approximately 8 emergency lighting packs were observed throughout CBB1. Prior to demolition, lead-containing materials should be segregated and disposed (or recycled) in accordance with the requirements of O. Reg. 347 including, but not limited to, generator registration, manifest requirements, and

Toxicity Characteristic Leachate Procedure (TCLP) testing for evaluation of disposal options.

Mercury

Mercury is present in Cell Block No. 1 in the form of fluorescent light tubes and a thermostat. There are approximately 387 fluorescent light tubes present in this building. In addition, one mercury-containing thermostat was observed in room 107. There are no regulatory requirements for the removal of mercury, however O. Reg. 347 regulates the disposal of mercury. All mercury-containing equipment should be recycled.

Extra care should be taken while handling fluorescent light tubes since breakage could release mercury. The tubes should be recycled. The cost to recycle the 387 fluorescent light tubes from Cell Block No.1 is estimated at approximately $300.

Prior to demolition, the mercury-containing thermostat should be placed in a non-breakable container and then in a tightly sealed plastic bag (polyethylene), and contents labelled "mercury- containing thermostat". If possible, the thermostat should be recycled through a thermostat recovery program (e.g. Honeywell's Take-Back Program) or disposed as a hazardous waste by a licensed hazardous waste disposal contractor. Common mercury waste (such as fluorescent lamps and thermostats) is not considered a subject waste under O. Reg. 347 as long it is destined for a mercury recovery facility. An MOE waste generator number and manifest would therefore not be required.

Silica

Silica is present in concrete, concrete blocks and bricks throughout Cell Block No.1 (e.g. floor/walls/ceiling in main building and the walls of the electrical vault). Silica dust could be generated during demolition through processes such as drilling, hammering, breaking, blasting, grinding, crushing, or sandblasting. When conducting demolition work of building materials containing silica, work procedures to protect workers should be implemented to comply with O. Reg. 845/90 including, but not limited to: implementation of an effective Silica Control Program detailing engineering controls during the removal (e.g. isolation of work area, dust control measures (typically wetting of work surfaces), proper ventilation, proper hygiene practices and use of personal protective equipment (typically dust masks and eye protection)).

Other Designated Substances

No other designated substances were observed in CBB1 during the site inspection.

Polychlorinated Biphenyls (PCBs)

Based on selective and representative inspection conducted on ballasts throughout the building, PCB-containing fluorescent light ballasts are likely not present in Cell Block No.1.

No other potential PCB-containing equipment was identified on site.

Ozone-Depleting Substances (ODS)

Three (3) pieces of ODS-containing equipment were identified in CBB1 and have been included in an updated Halocarbon Inventory for the institution. All decommissioning of equipment containing halocarbons must be performed in accordance with the Federal Halocarbon Regulations (SOR/2003-289) and O. Reg. 189/04. The latter assumes that none of this equipment can be re-used elsewhere.

Specifically, any of the air dryers or refrigerators which cannot be re-used elsewhere should be clearly identified as "out of service" and be relocated to a common area at the facility prior to start of demolition. A licensed contractor should then be retained to remove the refrigerant from each piece of equipment. The scrapped equipment should then be disposed off-site (preferably through a bulk metal recycler such as Kimco Steel Sales, Kingston, ON).

Summary of Halocarbon Equipment

Building Level	Quantity	Equipment Type	Refrigerant	Amount[1] (kg)
First Floor	1	Refrigerator	R134a	0.109
First Floor	1	Refrigerator	R12	0.135
Mechanical Room	1	Air dryer	R134a	0.10

Notes:

[1] Amount of refrigerant recorded in kg unless specified otherwise

Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified in the main building or the electrical vault.

Fuel, Oil and Waste Oil Storage

There is one (1) 1 L container of Devilbiss compressor oil and approximately 2 L of waste oil located in the mechanical room in the attic of Cell Block No.1.

Prior to the start of demolition, the compressor oil and waste oil should be disposed off-site through CSC's waste disposal program in accordance with the requirements of O.Reg. 347 (a small quantity exemption would apply for the disposal of <25 L per month).

Chemical Storage

A list of chemicals observed in Cell Block No.1 is provided in the following table. The items detailed in this table should be consolidated prior to demolition. Items that are in acceptable condition and can be reused such as fire extinguishers should be relocated accordingly to other buildings. Any materials that cannot be recycled/re-used should be disposed off-site by a provincially approved waste hauler in accordance with O. Reg. 347 (e.g. generator registration, use of waste manifest, etc.).

Summary of Chemical Storage

Building Level	Room	Chemicals
First Floor	101	- 3 x 5 lb fire extinguisher (dry chemical)
First Floor	102	- 1 x 10 lb fire extinguisher (CO_2)
Attic	Mechanical Room 301	- 1 x 10 lb fire extinguisher (CO_2) - 1 x 2 gallon fire extinguisher (water)

Radioactive Materials

No radioactive materials were observed in Cell Block No.1.

Mould

Water damage and/or mould was observed throughout the service tunnels and in the mechanical room in the attic. Appropriate respiratory protection (e.g. HEPA cartridge respirator) and clothing (Tyvek) should be utilized by demolition workers in accordance with the demolition program's health and safety plan, the Canadian Standards Association Manual for the Selection , Use, and Care of Respirators (CSA Z94.4-02), and the Environmental Abatement Council of Ontario's Mould Abatement Guidelines (EACO, Edition 1, 2004).

Additional Considerations

Several old desks, filing and storage cabinets, chairs, lockers, new cell mattresses, and miscellaneous office supplies are present throughout the building. The office furniture, supplies and mattresses should be removed prior to demolition.

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1. INTRODUCTION

Aqua Terre Solutions Inc. (Aqua Terre) was retained by Public Works and Government Services Canada (PWGSC), on behalf of Correctional Service of Canada, to conduct an Intrusive Designated Substance and Hazardous Materials Survey (DSHMS) of Cell Block No.1 (CBB1) of the Collins Bay Institution located in Kingston, Ontario. The assessment was required to meet the Occupational Health and Safety Act (OHSA) for contractor notification.

1.1 Site Description

Collins Bay Institution, currently owned and managed by Correctional Service of Canada (CSC), is a 485 cell, medium security facility, located in the City of Kingston, Ontario. The facility occupies approximately 11 hectares on federal reserve of 324 hectares, shared with Frontenac Institution. Private homes are located to the west and southwest, commercial properties and automobile dealerships to the north, industrial properties to the southeast, and a conservation area is located east of the site. Access to the Institution is via Highway 33 (Bath Road), which runs along the north boundary (Figure 1).

The subject building was constructed in 1937 and renovated in 1973 and 1978. It occupies an area of approximately 1400 m^2 and is comprised of a 2 story building with a basement and an attic. Although presently unoccupied, the building continues to be used for storage and is accessed by maintenance staff on a regular basis. The location of this building in the Collins Bay Institution is shown in Figure 2. Floor plans and sampling locations are shown in Figures 3 to 5.

All exterior walls, cell walls and ceiling are constructed of poured concrete coated with plaster. Interior walls and barrier walls, are comprised of terra cotta bricks covered with plaster.

The main entrance is located at the west end of Cell Block No.1, and is accessible via the main corridor. This building is also accessible from each door of the unit management offices (CBB1-UM). There is also an emergency fire exit on the first floor at the east end of the building leading to a fenced area outside.

The cell block range area of the building is rectangular in shape with a footprint measuring approximately 65 m by 18 m. The three offices, rooms 102, 104 and 105, at the west end of the building, measure approximately 3 m by 5 m, 3 m by 5 m and 2 m by 3 m respectively. The storage

area, room 103, and the washroom, room 106, are also at the west end of the building, and occupy an area of approximately 10 m^2 and 4 m^2 respectively. The building foundation, service tunnel walls, and above grade structure are constructed of poured concrete. The exterior building envelope consists of large limestone blocks with a copper panel roof.

The service corridor connecting the ranges, room 108, is accessible both at the east and west end of the building via the lobby and the exit corridor. There is also a ladder at the west entrance to the service corridor connecting the first and second floor services corridors as well as the service tunnel below. There are also two other service tunnels, rooms B01 and B03, beneath the building that connect the services to the main institution.

The attic consists of a large room divided into two separate sections and is only accessible via CBB1-UM. The entrance to the attic at the west end of CBB1, consists of a mechanical room. The floor and ceiling of the mechanical room consist of reinforced poured concrete. A small hatch leading to the roof of CBB1 is located at the north end of this area. The remainder of the attic is an open area with steel roof trusses, ventilation ducts, pipes and electrical conduits. The floor is poured concrete and the interior of the roof is covered with thermal insulation.

1.2 Scope of Work

Aqua Terre's scope of work was developed in response to PWGSC's Request for Proposal and was as follows:

- Review previous reports and drawings for the subject site pertaining to designated substances and other potentially hazardous materials;

- Prepare a health and safety plan for the field sampling/inspection program;

- Conduct site inspections and sampling. The designated substances surveyed were those designated under the Ontario Occupational Health and Safety Act and included (but were not limited to) asbestos, lead, mercury and silica. The hazardous materials surveyed included polychlorinated biphenyl (PCB) containing equipment, ozone-depleting substances (ODSs), urea formaldehyde foam insulation (UFFI), fuel, oil and/or waste oil storage, chemical storage, radioactive materials, and mould;

- Collect representative building material samples for analytical testing. A total of 23 building material samples were submitted for bulk asbestos analyses using the polarized light microscopy (PLM) method (resulting in 29 separate analyses). A total of 18 building material samples were submitted for asbestos analyses using the transmission electron microscopy (TEM) method (resulting in 16 separate analyses). In addition, 14 paint samples were submitted for laboratory analysis of lead;

- Prepare a survey report documenting the type, amount and location of designated substances and hazardous materials identified in Cell Block No.1.

1.3 Project Team

The site inspection and sampling program was conducted by a two person team including Mr. Kevin Strank and Mr. Cory van Hoof. Aqua Terre conducted the site inspection and sampling program on August 20, 27 and 28, 2007. Project management and senior level technical direction was provided by Mr. Mark Foerster, P. Geo.

1.4 Report Format

This report is divided into 7 sections, with the first being this introduction. Section 2 documents the methodology followed to complete the DSHMS used in the assessment. Sections 3 to 6 present the results of the DSHMS for each of the following areas: service tunnels, first floor and electrical vault, second floor (mezzanine), and the mechanical room / attic. Each section provides a summary of the area surveyed in terms of type of construction, etc. and the results for each designated substance and hazardous material assessed on a room-by-room basis. Results for the entire building are summarized in Section 7 for each substance that may be disturbed, handled, or disposed during any future demolition program.

Floor plans for each area assessed are presented in the figures. Laboratory certificates of analyses, and selected photographs are included in the appendices. Floor plans clearly show sampling locations, asbestos and/or lead concentrations, as well as any other pertinent information (e.g. chemical storage locations, office supply storage, etc.).

1.5 Limitations

The findings of this report are based upon visual observations and inspections on August 27 and 28, 2007. While every attempt was made to ensure that samples collected were representative of the general sampling area, it is possible that conditions outside specific sampling locations may differ. Therefore, users of this report are advised to observe conditions prior to conducting any repairs, removal, or renovation/demolition.

Only persons with documented, current training in the safe handling of the designated substances and hazardous materials should handle them. Persons handling any of the asbestos-containing materials (ACMs) identified in this survey, or conducting work in the vicinity of these ACMs are advised to consult this survey and individuals with appropriate experience and training, prior to doing so.

The statements made in this report are based solely on the information obtained to date as part of the above referenced study. Aqua Terre Solutions Inc. (Aqua Terre) has used its professional judgement in assessing this information and formulating its opinion and recommendations. New information may result in a change in this opinion. The mandate at Aqua Terre is to perform the tasks prescribed by the Client with the due diligence of the profession. No other warranty or representation, expressed or implied, as to the accuracy of the information or recommendations is included or intended in this report. The results of this study should in no way be construed as a warranty that the subject property is free from any and all contamination.

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2. SURVEY METHODOLOGY

The survey was conducted by Aqua Terre personnel on August 20, 27 and 28, 2007.

2.1 Site Inspections and Sampling

The survey was an intrusive room-by-room inspection in all areas of both the main building and electrical vault including:

- above suspended ceiling tiles;
- areas behind drywall;
- pipe chases; and,
- exterior features.

The DSHMS was undertaken in a manner that minimized repetition of inspection and sampling of like areas (e.g. similar pipe chases, floor tiles, paint colours, etc.).

All samples were collected and handled according to applicable occupational health and safety regulations. Specific sampling methodologies are summarized for each designated/hazardous substance in Sections 2.3 to 2.14.

2.2 Record Keeping

Sample labelling was kept simple to limit the potential for error and to provide greater efficiency. For example CBB1-AS-1a indicates the sample is from Cell block No.1 (CBB1), is of asbestos (AS), it was the first material sample in the building (1) and it was the first sample collected for that material type (a). If the sample was labelled CBB1-Pb-10 it indicates that the sample is a lead sample (Pb), and it is the 10^{th} sample collected in the building.

All sampling locations were recorded on site inspection forms and paper copies of the existing digital CADD drawings provided by PWGSC.

2.3 Asbestos-Containing Materials

"Room-by-room" visual inspections of all areas of the buildings were conducted in order to identify suspected asbestos-containing materials (ACMs). Areas above suspended lay-in tile ceilings, above plaster or gypsum board ceiling with access hatches and accessible pipe chases were also inspected. The survey included but was not limited to: thermal insulation, cement board, acoustic plaster, textured coat, plaster applications, ceiling tiles, vinyl flooring material and drywall joint compounds. In several areas, a section of drywall was removed to permit the inspection of piping within walls and ceiling. All areas of the building were accessible to Aqua Terre personnel during the inspection.

2.3.1 Assessment of Condition and Accessibility and Remedial Actions

The methodology used to assess the risk of exposure to building occupants was consistent with the PWGSC document entitled DM Directive 057- Asbestos Management (1997). Note that the building was not occupied by any inmates at the time of the inspection and there were no CSC personnel permanently occupying any space within the building. However, the building is used for storage and CSC personnel routinely access the building to bring/remove various items. Maintenance personnel also access the building on a regular basis. Although the intent of this assessment was to satisfy the requirements of the Occupational Health and Safety Act (OHSA) with respect to contractor notification, the recommendations are also consistent with DM Directive 057 due to the occupancy issues noted above.

The criteria used to assess the condition of the ACM are based on the type of asbestos material. In evaluating the condition of mechanical insulation (on boilers, breeching, ductwork, piping, tanks, equipment, etc.) the following criteria were 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.

Non-friable materials (e.g. vinyl floor tiles) 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.

The accessibility of building materials known or suspected of containing ACMs was rated in the field according to the following criteria:

ACCESS A	Areas of the building within reach (from floor level) of all building users.
ACCESS B	Frequently entered maintenance areas within reach of maintenance staff, without the need of a ladder.
ACCESS C (Exposed)	Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos-containing material.
ACCESS C (Concealed)	Areas of the building that require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems.
ACCESS D	Areas of the building behind inaccessible, solid ceiling systems, walls or mechanical equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the asbestos-containing material.

If laboratory analysis confirmed the presence of asbestos in the materials sampled, recommendations for remedial actions (if any) based on the condition and accessibility of the ACM were made and are discussed later in this report.

The Action Matrix provided below establishes the recommended asbestos control action for friable ACMs and was used to determine the appropriate remedial actions with respect to ACMs in the buildings. The matrix considers the exposure risk and accessibility of the ACMs. The Actions are described in full following the matrix.

ACCESS	CONDITION			DEBRIS
	GOOD	FAIR	POOR	
A	Action 5/7 [1]	Action 5/6 [2]	Action 3	Action 1
B	Action 7	Action 5/6 [3]	Action 3	Action 1
C (Exposed)	Action 7	Action 6	Action 4	Action 2
C (Concealed)	Action 7	Action 7	Action 4	Action 2
D	Action 7	Action 7	Action 7	Action 7

Notes:

1. If material in ACCESS A (GOOD Condition) is not removed, ACTION 7 is required.
2. If material in ACCESS A (FAIR CONDITION) is not removed, ACTION 6 is required.
3. Remove ACM in ACCESS B (FAIR CONDITION) if ACM is likely to be disturbed.

ACTION 1	**Immediate Clean-up of Debris That is Likely to be Disturbed** Restrict access that is likely to cause a disturbance of the ACM debris and clean up ACM debris immediately. Utilize correct asbestos procedures. This action is necessary for compliance with regulatory requirements. The surveyor should immediately notify the PWGSC Project Manager.
ACTION 2	**Entry into Areas with ACM Debris —Type 2 Precautions** At all locations where ACM debris can be isolated in lieu of removal or clean up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing Type-2 asbestos work precautions. The precautions will be required until the ACM debris has been cleaned up and the source of the debris has been stabilized or removed.
ACTION 3	**ACM Removal Required for Compliance** Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.
ACTION 4	**Access into Areas Where ACM is present and likely to be disturbed by Access-Type 2 Precautions** Use Type 2 asbestos precautions when entry of access into an area is likely to disturb the ACM. Action 4 must be used until the ACM is removed. (Use Action 1 or 2 if debris is present).

ACTION 5	**Proactive ACM Removal** Remove ACM in lieu of repair, or at locations where the presence of asbestos with an Exposure Risk of 1 is not desirable.
ACTION 6	**ACM Repair** Repair ACM that has an exposure risk of 2, and is not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material with an exposure risk of 1 and implement Action 7. If ACM is likely to be damaged or disturbed during normal use of the area or room, implement Action 5.
ACTION 7	**Routine Surveillance** Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (Type 1, Type 2 or Type 3) during the disturbance of the remaining ACM.

For non-friable materials, such as vinyl floor tiles, reported in GOOD condition, Action 7 (surveillance) is recommended regardless of accessibility.

DM Directive 057 defines Type 1, 2, and 3 work as follows (in Ontario, deviation from O. Reg. 278/05 are noted). In Ontario O. Reg. 278/05 would take precedence for any abatement, repair or asbestos removal work.

Type 1 Work

- Installation or removal of a non-friable ACM with a hand tool;
- Disturbance of a non-friable ACM with a powered tool equipped with a HEPA dust collection device;
- Removal of drywall materials where joint-filling materials contain asbestos (in Ontario the removal of more than 1 m^2 of drywall with ACM joint-filling is considered Type 2 work);
- Removal or replacement of ten or less asbestos-containing compressed mineral fibre type ceiling tiles;

- Collecting samples of asbestos-suspect friable materials; and,

- Working close to friable sprayed asbestos, where the material may be affected by the work activities.

Type 2 Work

- Removal or replacement of more than ten asbestos-containing compressed mineral fibre type ceiling tiles (in Ontario the requirement is for an area of ACM ceiling tiles that is greater than 7.5 m^2 that are installed or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated);

- Entry into ceiling spaces, crawlspaces, pipe tunnels, etc., where friable asbestos debris is present;

- In British Columbia, removal of drywall installed before 1980;

- Minor removal of friable ACM. Type 2 removal is limited to a maximum per work period of:
  - In British Columbia — 0.1 m^2 surface area, or 3 lineal metres of pipe insulation;
  - In Quebec — 0.03 m^2 of debris; and,
  - All Others — 1 m^2 of surface area.

- Repair of asbestos mechanical insulation (no limit is imposed as to the amount of repair permitted under Type 2 conditions).

Type 3 Work

- More than minor removal or disturbance of friable ACM;

- Use of a power tool on non-friable ACM without HEPA exhausted dust collection;

- The spray application of an encapsulant or sealer to friable asbestos surfacing materials;

- Disturbance of ductwork and air handling equipment serving or passing through areas of buildings with sprayed asbestos fireproofing or insulation; and,

- Repair, alteration or demolition of a boiler, furnace, kiln, or smaller equipment with asbestos-containing refractory.

O. Reg. "Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations O. Reg. 278/05" has similar but not identical definitions.

Standard respiratory protection and ventilation practices for asbestos work is summarized briefly in the following section for the three Types of asbestos removal work (note that this list is not exhaustive, refer to O. Reg. 278/05 (Table 2) for complete details).

Type 1 Operations - employer only needs to provide NIOSH approved respirator (air purifying half-mask respirator with P-100 particulate filter) at the request of the employee.

Type 2 Operations - employer needs to provide every worker who will enter the work area with a NIOSH approved respirator as detailed in Table 2 of O. Reg. 278/05. Depending on what work is being done (wetted vs. non-wetted) the type of respirator may include: full-face piece with R-100 or P-100 particulate filter, powered air purifying respirator, negative pressure (demand) system with full-face piece, or continuous flow supplied air respirator with a tight fitting face piece.

Type 3 Operations - similar to Type 2, but depends on application (refer to O. Reg. 278/05).

2.3.2 Sampling of Suspected Asbestos-Containing Materials

Visual checks of confirmed ACM were conducted to visually assess presence/absence of asbestos in similar materials and to minimize the number of required sample submissions. Field notes documenting building material characteristics (e.g. colour of floor tiles, pattern on ceiling tiles, etc.) were used to estimate extent of similar building materials once actual concentrations from the laboratory were known. Building materials that were never previously assessed (e.g. drywall, plaster) were sampled as part of this assessment.

Samples were collected to satisfy the requirements outlined in Section 3 of O.Reg. 278/05. Specifically, confirmation that asbestos is not present at concentrations of 0.5% or more by weight requires analysis of multiple bulk material samples as specified in Table 1 of O. Reg. 278/05 (based on material type and/or quantity). For example, a minimum of three negative samples are required to determine that a vinyl floor tile does not contain asbestos, however one sample is sufficient to indicate presence of asbestos. All the layers of a material suspected of containing asbestos were

sampled. During asbestos sample collection, procedures to minimize the potential release of asbestos fibres were followed, including the use of wetting methods. Personal protective equipment, including disposable gloves, were used when collecting samples to minimize cross-contamination between samples and the potential for inhalation of airborne asbestos fibres. After sample collection, the area was wet wiped to remove any dust that may have been created by sampling.

2.3.3 Analytical Methodology

Samples for laboratory analyses were collected in sealable plastic bags and shipped by courier to Lex Scientific Inc. (Lex) of Guelph, Ontario under Chain of Custody protocols. Lex is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analyses of bulk asbestos. Analyses of bulk samples for determination of asbestos content were performed using polarized light microscopy (PLM) procedures detailed in the US Environmental Protection Agency "Methods for the Determination of Asbestos in Bulk Building Materials, US EPA Report No. 600/R-93/116" as per O. Reg. 278/05. The laboratory method detection limit for asbestos analysis is 0.1% by weight. Asbestos, if present, was identified as one or more fibrous asbestos minerals, including chrysotile, amosite or crocidolite. Vinyl flooring material (i.e., vinyl floor tiles and vinyl sheet flooring) were analysed by EMSL Analytical Inc. in Westmont, N.J. using transmission electron microscopy (TEM) Chatfield methodology (Rev 2). The use of TEM for analysis of vinyl flooring material is required by US EPA Report No. 600/R-93/116 (which is referenced by O. Reg. 278/05).

The laboratory was requested to not test subsequent samples of an asbestos-containing material if the previous sample tested was positive for asbestos (i.e. contained greater than 0.5 percent asbestos). This is known as the "positive stop method."

As indicated in DM Directive 057 and O. Reg. 278/05, ACMs have been defined as materials containing 0.5 percent or greater of asbestos fibres. The materials that are commonly found are actinolite, amosite, anthrophyllite, chrysotile, crocidolite or tremolite.

2.4 Lead

During the "room-by-room" survey of the buildings, the presence of any materials or equipment that may contain lead were identified. These materials included (but were not limited to) paint, batteries and plumbing. The quantity and the condition of these materials were noted and identified on building plans.

A representative paint sample was collected from painted surfaces and submitted to Accutest Laboratories of Ottawa, Ontario. The analysis of paint samples for the determination of lead content was performed using an Aqua-Regia digest of the sample and Inductively Coupled Plasma (ICP) Emission Spectrometry. The Federal Hazardous Products Act (1976) limits the quantity of lead permissible in newly manufactured paints to 0.5% (5,000 ppm). On May 4, 2005, the Surface Coating Materials Regulations was promulgated and the limit on the amount of lead in paint was reduced to 0.06 % by weight (mg/kg), or 600 ppm. Paints having a lead content greater than 0.06 % are thus considered to be lead-based.

All painted areas of significant size (and different colour) were sampled and analysed for lead.

Other potential lead-containing materials found include the battery packs in emergency lighting and lead-packing on cast iron sewer pipe flanges.

2.4.1 Lead Paint Sampling

A chisel or utility knife was used to collect bulk lead paint samples. Paint was scraped directly off the substrate and into a plastic-sampling bag (Zip-Lock®), which was then sealed and labelled. All layers of paint were removed without removing the substrate.

2.5 Mercury

Mercury is a naturally occurring element that can exist in gas, liquid, or solid form and has many uses either in its pure metallic form or combined chemically with other elements as mercury compounds. It is commonly found in electrical equipment such as alkaline batteries, fluorescent lamp tubes, pressure controllers, thermostats, and some types of switches. Mercury is also used in medical and scientific instruments such as thermometers, sphygmomanometers (used to measure blood pressure), manometers, and barometers. During the "room-by-room" survey, the presence of

any materials or equipment containing mercury (or suspected of containing mercury) were identified and recorded. No samples of mercury were collected.

Mercury is listed as a toxic substance in Schedule 1 of the Canadian Environmental Protection Act (CEPA) and substances containing mercury can be considered hazardous waste in Ontario if leachable mercury concentrations exceed 0.1 mg/L (O.Reg. 347). Environment Canada advises that fluorescent light bulbs should be considered hazardous waste in Ontario unless they are proved otherwise by testing as required by O.Reg. 347. O. Reg. 844 (as amended) prescribes that worker exposure to mercury compounds be maintained at the lowest practical level and regulates maximum exposure limits for workers.

2.6 Silica

Silica occurs naturally as crystalline or amorphous material. It is normally found in concrete, mortar, and stucco finishes. Crystalline silica is more toxic than amorphous silica, and therefore, is the form regulated under the OHSA. O. Reg. 845 (as amended by O.Reg. 606/05) prescribes that worker exposure to silica dust be maintained at the lowest practical level and regulates maximum exposure limits for workers.

During the "room by room" inspection the presence of potential silica-containing materials was recorded. No samples of silica were collected.

2.7 Other Designated Substances

Other designated substances that were included in the current survey were: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride. None of these substances were observed in any of the areas during the site inspection.

2.8 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) can be found in equipment such as transformers, capacitors, electromagnets, heat transfer units, hydraulic engine fluid, and fluorescent lamp ballasts. PCBs are not a designated substance but are a material of concern. During the "room by room" survey, information on nameplates on representative fluorescent lights were recorded and compared against

published information provided by the equipment manufacturers regarding confirmed or potential PCB content in dielectric fluids. A representative number of fluorescent light ballasts were inspected. The fluorescent light ballasts were selected based on age of the fixture and time. The approximate age of some of the fixture was determined by the size of the tube. According to Collins Bay electricians, the majority of the fluorescent light fixtures had been recently upgraded from the older T12 tubes to the newer energy efficient T8 tubes. The newer T8 tubes require a more energy efficient electronic ballast, as opposed to the magnetic ballast of the T12 tube. Fluorescent light fixtures with T8 tubes were assumed to contain non PCB ballasts.

2.9 Ozone Depleting Substances (ODSs)

The release of chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and bromofluorocarbons (halons) has been linked to the depletion of the ozone layer. These substances are considered ozone depleting substances and many are regulated under various federal and provincial regulations (e.g. Montreal Protocol, Canadian Environmental Protection Act, Ozone-Depleting Substances Regulations).

During survey activities, the presence of any equipment containing refrigerants (which contain ozone-depleting substances (ODSs)) were recorded. For each piece of equipment the manufacturer name, type of refrigerant and volume of refrigerant was recorded. The survey completed by Aqua Terre includes all ODS-containing equipment present in Cell Block No.1, including refrigerators/freezers, air conditioners (split units and window units) and dehumidifiers.

2.10 Urea Formaldehyde Foam Insulation (UFFI)

Urea formaldehyde foam insulation (UFFI) was developed in the 1950s as a means of insulating difficult to reach areas within homes and its use became prominent in the 1970s as a means of increasing energy efficiency. The use of UFFI was banned in 1980 due to concern of formaldehyde off-gassing from UFFI and the resultant health implications.

A "room-by-room" survey inspections of the walls was conducted in order to determine the presence of any urea formaldehyde foam insulation (UFFI). The interior and accessible exterior walls were inspected for evidence of repaired openings (i.e., "nozzle holes") made for installation of the insulation. No UFFI material was identified in Cell Block No.1.

2.11 Fuel, Oil and/or Waste Oil Storage

The locations inside the buildings that stored fuel/oil were examined during the building inspection. The approximate quantity and storage practices for fuel, oil and waste oil were noted.

2.12 Chemical Storage

The locations and types of chemicals stored in each building were noted and recorded.

2.13 Radioactive Materials

During survey activities, the presence of any equipment with labels indicating the use of radioactive materials was recorded.

2.14 Mould

As part of the DSHMS, visual inspections were conducted in each room for evidence of potential mould growth and/or water damage. Observations are summarized in this report.

3. SERVICE TUNNELS

3.1 Tunnel Description

There are three service tunnels that run east to west under the building, B01, at the south end of the building, B03, at the north end, and a central service tunnel. Both B01 and B03 are accessed via the institution's main service tunnel. The central tunnel (as shown in Appendix A, Photo10) can only be accessed from the first floor of Cell Block No.1. The tunnel walls and ceiling are constructed of poured concrete. Tunnel B01 contains various pipes, insulated and non insulated, and conduits secured to racks, walls and ceiling. Tunnel B03 (as shown in Appendix A, Photo 9) contains conduits and fire protection pipes mounted on the walls and ceiling. The central tunnel contains various water supply and sewer pipes and debris. Figure 3 shows the approximate layout of the tunnels.

3.2 Survey Findings

The DSHMS of the basement was conducted by Aqua Terre personnel on August 20, 27 and 28, 2007. The results of the DSHMS are presented in the subsections of Section 3.2. Recommendations for removal procedures for the identified designated substances and hazardous materials in the tunnels are provided in Section 7. Selected photographs showing areas of concern are provided in Appendix A. Laboratory certificates of analysis for asbestos and lead samples are provided in Appendices B and C, respectively.

3.2.1 Asbestos-Containing Materials (ACMs)

No samples were collected from the service tunnels on August 20, 27 and 28, 2007 for bulk asbestos analysis by PLM and/or TEM. However, Aircell insulation (sample CBB1-AS-12 collected on the first floor service corridor, (refer to Section 4.21) is also present in the central service tunnel (as shown in Appendix A, Photo 8) as well as the small pipe chase that lies between the central service tunnel and B01. The insulation is comprised of 70% chrysotile asbestos. Asbestos survey results for the service tunnel are summarized in Table 3.1.

Table 3.1 Summary of Asbestos Survey, Basement Service Tunnels

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-12	**Service Tunnel**	**10 cm Aircell insulation around piping (no parging)**	**Friable**	**Poor (2 m)**	**B**	**4**	**© 70%**	**2 m**
CBB1-AS-12	**Service Tunnel (South, between the central service tunnel and B01)**	**15 cm Aircell insulation around piping (no parging)**	**Friable**	**Poor (6 m)**	**B**	**4**	**© 70%**	**6 m**
CBB1-AS-12	**Service Tunnel (South, between the central service tunnel and B01)**	**7.5 cm Aircell insulation around piping (no parging)**	**Friable**	**Poor (6 m)**	**B**	**4**	**© 70%**	**6 m**

Notes:

[1] Friability is assessed as friable or non-friable

[2] Condition is rated as good, fair or poor

[3] Accessibility is A, B, C(exposed), C(concealed) or D as defined in Section 2.3.1.

[4] Action is 1, 2, 3, 4, 5, 6 or 7 as defined in Section 2.3.1.

[5] Asbestos Content is Chrysotile ©, Amosite (A) or Other Fibre (O) expressed as a percentage

ND None Detected (for PLM <0.1%; TEM <0.1-0.2%)

bold Asbestos Content > 0.5 %

3.2.2 Lead-Containing Materials

The ceiling and walls of the tunnels consists of unpainted concrete, therefore no paint samples were collected in the service tunnels for laboratory analysis of lead.

Cast iron pipe flanges containing leaded packing material (up to 100% lead) were observed in B01, the central service tunnel, and B03. This soft, grey, malleable material was commonly used as a sealant between joints on cast iron pipes. Approximately two hundred (200) pipe flanges, ranging in diameter from 4 to 18 inches, were observed in the basement.

No other sources of lead such as lead-containing batteries, lead pipes or lead wiring were identified during the survey by Aqua Terre. Lead-containing solder may be present in water lines throughout the building.

3.2.3 Mercury

Fluorescent light bulbs contain between 0.01 to 0.04 g of mercury vapour depending on manufacturer and age (Environment Canada, 2002). The number of fluorescent light fixtures observed in the service tunnels was approximately 40. Assuming two (2) bulbs per fixture an estimated 80 fluorescent light bulbs are contained in the service tunnels, indicating that the total amount of mercury in the bulbs in the service tunnels could range from 0.8 to 3.2 g.

3.2.4 Silica

Silica is contained in the concrete and concrete blocks observed throughout the basement service tunnels.

3.2.5 Other Designated Substances

During this survey, none of the following designated substances were observed in the service tunnels: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates or vinyl chloride.

3.2.6 Polychlorinated Biphenyls (PCBs)

Forty (40) fluorescent light ballasts were observed in the service tunnels. Based on selective and

representative inspection conducted on ballasts throughout the building, PCB-containing fluorescent light ballasts are likely not present in the service tunnels.

3.2.7 Ozone Depleting Substances (ODSs)

No ODS-containing equipment was observed in the service tunnels.

3.2.8 Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified in the service tunnels.

3.2.9 Fuel, Oil and/or Waste Oil Storage

No fuel, oil or waste oil storage were observed in the service tunnels.

3.2.10 Chemical Storage

No chemicals were observed in the service tunnels.

3.2.11 Radioactive Materials

No radioactive materials were observed in the service tunnels.

3.2.12 Mould

Water damage, musty odours and/or mould growth were observed/detected on the walls and floor throughout the service tunnels.

3.2.13 Other Toxic Materials

The pesticide Contrac Blox was found throughout the service tunnels. This type of rodent poison contains 0.005% bromadiolone. Bromadiolone is an anticoagulant and may cause haemorrhaging if swallowed or following skin contact. Prior to demolition it should either be removed and reused elsewhere, or be disposed as a hazardous waste.

4. FIRST FLOOR & ELECTRICAL VAULT

4.1 First Floor and Electrical Vault Description

The first floor contains eighty-two (82) rooms (cells, showers, cells A1 to A35 and B1 to B35, range A and range B, two barriers, exit corridor, lobby, 3 offices, storage, washroom, service corridor, four (4) stairwells, and an electrical vault (Figure 4)).

The range walls are constructed of poured concrete covered with painted plaster (Appendix A, Photo 2). Many of the concrete columns between the windows are damaged and have deteriorated likely due to water damage. Some of these have been repaired with concrete blocks and plaster. The walls and ceiling of the cells are poured concrete with 1 inch thick metal bars on the front side. Office furniture and new cell mattresses are found throughout the first floor (as shown in Appendix A, Photos 1, 2, 3 and 5).

The electrical vault, located at the north west end of CBB1 is only accessible via a fenced area outside the building. The exterior walls of Cell Block No.1 and main corridor make up the south and west walls of the electrical vault. The north and east walls of the electrical vault are of concrete block construction. The vault has a steel roof deck and a poured concrete floor. The interior walls are plywood. There are two (2) dry transformers within the electrical vault.

4.2 Survey Findings

The DSHMS of the first floor was conducted by Aqua Terre personnel on August 27 and 28, 2007. The results of the DSHMS are presented in the subsections of Section 4.2. Recommendations for removal procedures for the identified designated substances and hazardous materials on the ground floor are provided in Section 7. Selected photographs showing areas of concern are provided in Appendix A. Laboratory certificates of analysis for asbestos and lead samples are provided in Appendices B and C, respectively.

4.2.1 Asbestos-Containing Materials (ACMs)

A total of thirty-five (35) samples were submitted from the first floor on September 4, 2007 for bulk asbestos analysis. Fourteen (14) floor tile samples were submitted for bulk asbestos analysis using the TEM (Chatfield) method. Twenty-one (21) samples were submitted for bulk asbestos analysis using the PLM method. Results are presented in Table 4.1. The sample identification numbers,

room number (where sampled and/or observed), description of material, friability, condition, accessibility, recommended action, asbestos content and estimated quantity (only for ACMs) are also included in Table 4.1.

Previous plaster and floor tile samples collected by a previous consultant in 2002 (XCG, 2002) were found to contain <1% chrysotile. These samples are not recognized as non ACMs since O.Reg. 278/05 has reduced the criteria for asbestos containing material to <0.5% by weight.

Plaster samples were collected from the interior and exterior walls of the ranges, rooms 107 and 109. The sample collected from the interior wall, between cells A4 and A5, contained <0.5% amosite asbestos. The plaster is not considered an ACM since the DM Directive 057 and O. Reg. 278/05 defines ACMs as materials containing 0.5 percent or greater of asbestos fibres.

Suspended ceiling tile samples were collected from rooms 102, 104 and 105. These tiles were historically considered to be ACM based on similar ceiling tiles found elsewhere in the institution (XCG, 2002). Analytical results from CBB1-As-8A to 8C indicated that the ceiling tiles are not asbestos- containing material.

The following ACMs were identified on the first floor:

- ACM pipe insulation was confirmed in room 104 (as shown in Appendix A, Photo 4). The insulation was comprised of 90 % amosite asbestos. There were two pipes insulated with similar material in the pipe chase that extended from the floor of room 104 above the suspended ceiling. The pipe insulation ranges in size from 4 to 6 inches in diameter.

- ACM pipe elbow insulation was confirmed visually in room 104. The elbow was located above the suspended ceiling and appeared to be in good condition.

- Two (2) types of asbestos-containing vinyl floor tiles were confirmed on the first floor. The off-white tiles, observed in rooms 101 to 103, 104 (under the carpet), 107, 109, and in cells A3 to A17, B4 to B17, B20, B21, B23, B24, B26, B27, and B30 to B35, contain chrysotile asbestos in concentrations ranging from 3.2% to 6.5%. The beige floor tiles, observed in cells A8 to A17, A20 to A27, A29 to A35, B19, B22 and B28, contain chrysotile asbestos in concentrations ranging from 4.0 % to 7.9 %.

- ACM (70% chrysotile) Aircell pipe insulation was identified in the service corridor, room 108 (as shown in Appendix A, Photo 8). The insulation, in poor condition, is approximately 3 m in length and continues to the second floor and basement.

Table 4.1 Summary of Asbestos Survey, First Floor

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-1A **CBB1-AS-1B** **CBB1-AS-1C**	**101-104** **107, 109** **A3-A7** **B4-B17** **B20, B21,** **B23, B24,** **B26, B27,** **B30-B35**	**Vinyl floor tile, off-white, 12"x12"** **Samples collected in 101, 107 and 109**	**Non-friable**	**Good (599)** **Fair (48)** **Poor (20)**	**A**	**763**	**© 3.2-6.5%**	**667 m^2**
CBB1-AS-2A CBB1-AS-2C CBB1-AS-2D CBB1-AS-2E CBB1-AS-2F CBB1-AS-2G	101-105 107 109-112 A1-A35 B1-B35	Plaster, 2 layers Samples collected in 107 and 109	N/A	N/A	N/A	N/A	ND ND ND ND ND (A) <0.5%	3301 m^2
CBB1-AS-3A CBB1-AS-3C	A19, A28, B3, B18, B19, B25, 107, 109	Vinyl floor tile, grey, 12"x12" Samples collected in B3 and A19	N/A	N/A	N/A	N/A	ND	27 m^2
CBB1-AS-4A CBB1-AS-4C	A19, A28, B3, B18, B19, B25, 107, 109	Vinyl floor tile, white, 12"x12" Samples collected in B25 and 107	N/A	N/A	N/A	N/A	ND	27 m^2

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-5A CBB1-AS-5C	A3-A35, B3-B35, 107, 109	Sheet flooring, grey Samples collected in 109 and A17	N/A	N/A	N/A	N/A	ND	101 m^2
CBB1-AS-6A CBB1-AS-6B	**A8-A17, A20-A27, A29-A35, B19, B22, B28**	**Vinyl floor tile, beige, 12"x12" Samples collected in A9 and B19**	**Non-friable**	**Good (110) Fair (30)**	**A**	**76**	**© 4.0-7.9%**	**140 m^2**
CBB1-AS-7A CBB1-AS-7B CBB1-AS-7C	104103106	Drywall	N/A	N/A	N/A	N/A	ND	48 m^2
CBB1-AS-8A CBB1-AS-8B CBB1-AS-8C	104102105	Ceiling tile, 2'x4'	N/A	N/A	N/A	N/A	ND	39 m^2
CBB1-AS-9A CBB1-AS-9B CBB1-AS-9C	**104**	**Pipe insulation (no parging) 1 pipe elbow with parging (4")**	**Friable Friable**	**Good Good**	**C(concealed) C(concealed)**	**7 7**	**(A) 90%**	**19 m 1 elbow**
CBB1-AS-10A CBB1-AS-10B CBB1-AS-10C	101	Vinyl floor tiles, green, 12"x12"	N/A	N/A	N/A	None	ND	5 m^2

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-11A CBB1-AS-11B CBB1-AS-11C	104103106	Joint Compound	N/A	N/A	N/A	None	ND	1.5 m^2
CBB1-AS-12A CBB1-AS-12B CBB1-AS-12C	**108**	**10 cm Aircell insulation around piping (no parging)**	**Friable**	**Poor**	**B(accessible to maintenance)**	**4**	**© 70%**	**3 m**

Notes:

[1] Friability is assessed as friable or non-friable

[2] Condition is rated as good, fair or poor

[3] Accessibility is A, B, C(exposed), C(concealed) or D as defined in Section 2.3.1.

[4] Action is 1, 2, 3, 4, 5, 6 or 7 as defined in Section 2.3.1

[5] Asbestos Content is Chrysotile ©, Amosite (A) or Other Fibre (O) expressed as a percentage

NA Area re-sampled and is part of Aqua Terre's estimated quantities.

ND None Detected (for PLM <0.1%; TEM <0.1-0.2%)

bold Asbestos Content > 0.5 %

4.2.2 Lead-Containing Materials

Ten (10) paint samples were collected from the first floor and submitted for laboratory analysis of lead. A summary of the lead paint survey is provided in Table 4.2. The sample identification numbers, room number (where paint samples are also found), description and sample location, condition, layers, lead content and approximate area are also included in Table 4.2. Sample locations and areal extent of paint containing greater than 600 ppm of lead are shown in the floor plans in Figure 4.

Table 4.2 Summary of Lead Paint Survey, First Floor

Sample ID	Room Number	Colour, Location and Description	Condition[1]	Layers Noted[2]	Lead Content (ppm)	Estimated Quantity (m^2)
CBB1-Pb-1	**101-103, 105, 107, 109, 110, 112, A3**	**light blue grey, on walls and ceiling (plaster), Sample collected in 109**	**Good (1297) Fair (207)**	**no**	**45300**	**1504 m^2**
CBB1-Pb-2	**101, 107, B31, B33, B34**	**Teal, on radiators and on cell walls. Sample collected in 109**	**Good**	**no**	**1310**	**163 m^2**
CBB1-Pb-3	**101, 107, 109, B33, B34**	**Burgundy, on stairs, and on cell walls. Sample collected on stairs #2.**	**Good**	**Top layer, brown, yellow**	**2100**	**125 m^2**
CBB1-Pb-4	B20, C10	Red glaze, on cell floor	Good	no	80	4.5 m^2
CBB1-Pb-5	**101, 110, 112, A3-A35, B3-B35**	**Dark blue grey, on walls and bars, sample collected on second floor D6**	**Good**	**Top layer, light blue, red-brown, silver (primer)**	**3560**	**73 m^2**
CBB1-Pb-8	107, 109, 111, 112, B16, B30, B31	Dark grey, over floor tiles. Sampled in B16	Good	no	543	100 m^2
CBB1-Pb-9	B3, B18, B25, B29	Mid blue grey, on cell walls. Sampled in B16	Good	Top layer, light blue,	46	88 m^2

Sample ID	Room Number	Colour, Location and Description	Condition[1]	Layers Noted[2]	Lead Content (ppm)	Estimated Quantity (m^2)
				yellow		
CBB1-Pb-10	B20, B34	Black glaze, on cell floor. Sampled in B20	Good	Clear, black, pink	9	6 m^2
CBB1-Pb-11	109, 110, B28	Light grey, on floor, Sampled in 109	Good (17) Fair (5)	no	125	22 m^2
CBB1-Pb-12	111, B1, B2, A1, A2	Cream, on walls and ceiling. Sampled in B2	Good	no	71	61 m^2
CBB1-Pb-13	104	Dark blue, on wall (plaster)	Good	no	27	15 m^2
CBB1-Pb-14	104	Mint green, on wall (plaster and concrete blocks)	Good	Top layer, beige	8	27 m^2

Notes:

[1] Condition is rated as good, fair or poor with peeling and/or flaking

[2] Layers of paint are noted visually and can only be observed if the layers are different colour

bold Exceeds the Surface Coating Materials Regulations limit of 0.06 % by weight (mg/kg), or 600 ppm

The light blue grey paint (45300 ppm lead) in rooms 101 to 103, 105, 107, 109, 110, 112, and cell A3 was observed on plastered walls and ceilings. Teal paint (1310 ppm lead) in rooms 101 and 107 and in cells B31, B33 and B34 was present on radiators, cell walls and ceilings, and the roof of room 102. Burgundy paint (2100 ppm lead) in rooms 101, 107 , 109, and cells B33 and B34 was present on stairs, catwalks, trim above windows, beams, cell walls and the roof of room 103. Dark blue grey paint (3560 ppm lead) in rooms 101, 110, 112, and in cells A3 to A35 and B3 to B35 was present on walls and bars.

Cast iron pipe flanges likely containing leaded packing material were observed in room 108. Approximately 288 pipe flanges measuring 4 inches in diameter and approximately 72 pipe flanges measuring 2 inches in diameter were observed on the first floor.

Lead-containing batteries may be present in emergency lighting packs. Four (4) emergency lighting packs were observed in the service corridor, room 108 (Appendix A, Photo 7) and one (1) in the electrical vault.

No other sources of lead such as lead pipe or lead wiring were identified in accessible areas during the survey by Aqua Terre. Lead-containing solder may be present in water lines throughout the building.

4.2.3 Mercury

Fluorescent light bulbs contain between 0.01 to 0.04 g of mercury vapour depending on manufacturer and age (Environment Canada, 2002). The number of fluorescent light bulbs observed by Aqua Terre on the first floor and electrical vault was approximately 228, indicating that the total amount of mercury in the bulbs on the first floor, including the electrical vault, could range from 2.28 to 9.12 g.

One (1) mercury-containing thermostat was observed in room 107 (as shown in Appendix A, Photo 6). The mercury thermostat likely contains approximately 3 g of mercury.

4.2.4 Silica

Silica is contained in the concrete observed as the base for the flooring, the walls and ceiling in each cell as wells as the exterior walls of cell block No.1.

4.2.5 Other Designated Substances

During this survey, none of the following designated substances were observed on the first floor: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates or vinyl chloride.

4.2.6 Polychlorinated Biphenyls (PCBs)

One hundred and twenty-six (126) fluorescent light ballasts were observed on the first floor. Based on selective and representative inspection conducted on ballasts throughout the building, PCB-containing fluorescent light ballasts are likely not present in the fluorescent light fixtures on the first floor.

4.2.7 Ozone Depleting Substances (ODSs)

A summary of the ODS-containing equipment observed on the ground floor is provided in Table 4.3.

Table 4.3 Halocarbon Inventory, First Floor

Room Number	Quantity	Equipment Type	Manufacturer, Serial Number and Model Number	Refrigerant	Amount[1] (kg)
110	1	Refrigerator	Maytag SN. 11950055ZQ Model No. MTB1956GEW	R134a	0.109
110	1	Refrigerator	WCI Canada SN. 851009048 Model No. 1353E-L01	R12	0.135

Notes:

[1] Amount of refrigerant recorded in kg unless specified otherwise

4.2.8 Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified on the first floor.

4.2.9 Fuel, Oil and/or Waste Oil Storage

No fuel, oil or waste oil storage devices were identified on the first floor.

4.2.10 Chemical Storage

Four fire extinguishers were observed on the first floor. Three 5 lb ABC fire extinguishers with ratings of 3A 10BC were found in lobby, room 101, and one 10 lb CO_2 fire extinguisher was found in an office, room 102. No other chemicals were identified on the first floor.

4.2.11 Radioactive Materials

No radioactive materials were observed on the first floor.

4.2.12 Mould

No mould growth was observed/detected on the first floor.

4.2.13 Hazardous Material

Pigeon faeces were observed along the interior windowsills of both ranges A and B.

5. SECOND FLOOR (MEZZANINE)

5.1 Second Floor Description

The second floor contains seventy-seven rooms, including showers, cells C3 to C35 and D3 to D35, two catwalks, two fire exits, two barriers and a central service corridor. Figure 5 shows the second floor layout and sampling locations.

5.2 Survey Findings

The DSHMS of the second floor was conducted by Aqua Terre personnel on August 27 and 28, 2007. The results of the DSHMS are presented in the subsections of Section 5.2. Recommendations for removal procedures for the identified designated substances and hazardous materials on the second floor and in the attic are provided in Section 7. Selected photographs showing areas of concern are provided in Appendix A. Laboratory certificates of analysis for asbestos and lead samples are provided in Appendices B and C, respectively.

5.2.1 Asbestos-Containing Materials (ACMs)

Five (5) samples were collected from the second floor on August 27 and 28, 2007 for bulk asbestos analysis using the PLM and/or the TEM (Chatfield) method. Vinyl floor tile and sheet floor samples were submitted for bulk asbestos analysis using the TEM (Chatfield) method. All other samples were submitted for bulk asbestos analysis using the PLM method. Results are presented in Table 5.1. The sample identification numbers, room number (where sampled and/or observed), description of material, friability, condition, accessibility, recommended action, asbestos content and estimated quantity (only for ACMs) are also included in Table 5.1. Approximate sampling locations and areal or lateral extent of ACMs (if present) are shown on the floor plan in Figure 5.

The following ACMs were identified:

- Asbestos-containing vinyl floor tile was observed on the second floor. The tiles (3.2-6.5% chrysotile) were observed in cells C22 to C35, D3 to D10, D12 to D29, and D31 to D35.
- ACM aircell pipe insulation (70% chrysotile) was observed in the second floor service corridor. This is the same insulation observed in both the first floor service corridor and the service tunnel. The insulation is in poor condition and is approximately 1.5 m in length.

Table 5.1 Summary of Asbestos Survey, Second Floor

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-1	**C22-C35, D3-D10, D12-D29, D31-D35**	**Vinyl floor tile, off-white, 12"x12" Samples collected on the first floor in rooms 101, 107 and 109**	**Non-friable**	**Good (135 m^2) Fair (75 m^2) Poor (23 m^2)**	**A**	**753**	**© 3.2-6.5%**	**233 m^2**
CBB1-AS-2b	203-206, C1-C35, D1-D35	Plaster, 2 layers. Sample in room C35	N/A	N/A	N/A	N/A	ND	1593 m^2
CBB1-AS-3b	C17, D30	Vinyl floor tile, grey 12"x12". Sample collected in room D30	N/A	N/A	N/A	N/A	ND	6 m^2
CBB1-AS-4b	C17, D30	Vinyl floor tile, white, 12"x12". Sample collected in room C17.	N/A	N/A	N/A	N/A	ND	4 m^2
CBB1-AS-5b	C3-C35, D3-D35	Sheet flooring, grey, 12"x12". Sample collected in room C12.	N/A	N/A	N/A	N/A	ND	33 m^2
CBB1-AS-6c	**C3-C16, C18-C21, D11**	**Vinyl floor tile,beige, 12"x12". Sample collected in room C6.**	**Non-friable**	**Good (64) Fair (22)**	**A**	**75**	**© 4.0-7.9%**	**86 m^2**

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-12	**Service Corridor**	**10 cm Aircell insulation around piping**	**Friable**	**Poor (1.5 m)**	**B(accessible to maintenance)**	**4**	**© 70%**	**1.5 m**

Notes:

[1] Friability is assessed as friable or non-friable

[2] Condition is rated as good, fair or poor

[3] Accessibility is A, B, C(exposed), C(concealed) or D as defined in Section 2.3.1.

[4] Action is 1, 2, 3, 4, 5, 6 or 7 as defined in Section 2.3.1

[5] Asbestos Content is Chrysotile ©, Amosite (A) or Other Fibre (O) expressed as a percentage

ND None Detected (for PLM <0.1%; TEM <0.1-0.2%)

bold Asbestos Content > 0.5%

5.2.2 Lead-Containing Materials

Four (4) samples of paint were collected from the second floor and submitted for laboratory analysis of lead. A summary of the lead paint survey including sample identification numbers, room number (where sampled), description, condition, layers, lead content and approximate area is provided in Table 5.2. Sample locations and areal extent of paint containing greater than 600 ppm of lead are shown in the floor plans in Figure 5. The light blue grey paint found on the walls throughout the second floor is the same as that found on the walls throughout the first floor (CBB1-Pb-1, lead = 45300 ppm).

Table 5.2 Summary of Lead Paint Survey, Second Floor

Sample ID	Room Number	Colour, Location and Description	Condition[1]	Layers Noted[2]	Lead Content (ppm)	Estimated Quantity (m^2)
CBB1-Pb-1	**203, 205, 206, C3-C35, D3-D35**	**Light blue grey, on walls and ceiling (plaster), Sample collected on first floor room 109**	**Good (1427 m^2) Fair (20 m^2)**	**no**	**45300**	**1447 m^2**
CBB1-Pb-2	**206**	**Teal, on radiators in cells, and on roof of 102. Sample collected on first floor in room 109**	**Good**	**no**	**1310**	**10 m^2**
CBB1-Pb-3	**206**	**Burgundy, on stairs, catwalk, above windows, on beams, on cell walls, and on roof of 103. Sample collected on stair #2**	**Good**	**Top layer, brown, yellow**	**2100**	**11 m^2**
CBB1-Pb-5	**203, 205, 206, C3-C35, D3-D35**	**Dark blue grey, on walls and bars, sample collected in room D6**	**Good**	**Top layer, light blue, red-brown, silver (primer)**	**3560**	**70 m^2**
CBB1-Pb-6	C10, D17	Red, on wall and tiles. Sampled in room D17	Good	Top layer, lead grey	220	23 m^2

Sample ID	Room Number	Colour, Location and Description	Condition[1]	Layers Noted[2]	Lead Content (ppm)	Estimated Quantity (m^2)
CBB1-Pb-7	**C26, C29**	**Black, on tiles and walls. Sampled in room C29**	**Good**	**Top layer, White, Green**	**2400**	**8 m^2**
CBB1-Pb-8	203-206	Dark grey, over floor tiles. Sampled on first floor in room B16	Good	no	543	28 m^2
CBB1-Pb-9	D8, D19	Mid blue grey, on cell walls. Sampled on first floor in room B16	Good	Top layer, light blue, yellow	46	27 m^2
CBB1-Pb-12	204, C1, C2, D1, D2	Cream, on walls and ceiling. Sampled on first floor in room B2	Good	no	71	67 m^2

Analytical results indicated that three (3) paint samples, collected on the first floor, also observed on the second floor, contained concentrations of lead above 600 ppm.

The burgundy paint (CBB1-Pb-3), also found on the first floor, contained 2100 ppm of lead and was also observed on the ramp and door in room 206 leading to the CBB1 Unit Management offices. The dark blue grey paint (CBB1-Pb-5) observed on the walls and bars, contained 1310 ppm of lead. The black paint on floor tiles and cell walls contained 2400 ppm of lead.

Cast iron pipe flanges likely containing leaded packing material were observed on the second floor corridor, room 201. Approximately two hundred and sixteen (216) pipe flanges measuring 4 inches in diameter and one hundred and forty-four (44) pipe flanges measuring 2 inches in diameter were observed on the second floor.

No other sources of lead such as lead pipe or lead wiring were identified in accessible areas during the survey by Aqua Terre. Lead-containing solder may be present in water lines throughout the building.

5.2.3 Mercury

Fluorescent light bulbs contain between 0.01 to 0.04 g of mercury vapour depending on manufacturer and age (Environment Canada, 2002). The number of fluorescent light bulbs observed

by Aqua Terre on the second floor was approximately one hundred and sixty-three (163), indicating that the total amount of mercury in the bulbs on the second floor could range from 1.63 to 6.52 g.

5.2.4 Silica

Silica is present in the concrete observed as the base for the flooring, the walls and ceiling in each cell as well as the service corridor walkway.

5.2.5 Other Designated Substances

During this survey, none of the following designated substances were observed on the second floor: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates or vinyl chloride.

5.2.6 Polychlorinated Biphenyls (PCBs)

Eighty-seven (87) fluorescent light ballasts were observed on the second floor. Based on selective and representative inspection conducted on ballasts throughout the building, PCB-containing fluorescent light ballasts are likely not present in the fluorescent light fixtures on the second floor.

5.2.7 Ozone Depleting Substances (ODSs)

No ODS-containing equipment was observed on the second floor.

5.2.8 Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified on the second floor.

5.2.9 Fuel, Oil and/or Waste Oil Storage

No fuel, oil or waste oil storage devices were identified on the second floor.

5.2.10 Chemical Storage

No chemicals were observed on the second floor or in the attic.

5.2.11 Radioactive Materials

No radioactive materials were observed on the second floor.

5.2.12 Mould

No water damage or mould growth was observed on the second floor.

6. THIRD FLOOR MECHANICAL ROOM / ATTIC

6.1 Mechanical Room Description

The attic consists of a large room (301) divided into two sections. It is only accessible via the Cell Block No.1 Unit Management offices. The small section at the entrance to the room (west end of CBB1) contains HVAC (two air handling units) and mechanical equipment (a compressor and an air dryer). The floor and ceiling of the mechanical area consist of reinforced poured concrete. A small hatch leading to the roof of CBB1 was observed at the north end of this area. The remainder of the attic is an open area with steel support beams, air ducts, pipes and electrical conduits. The floor is poured concrete and the roof exterior is covered with large copper sheets. The interior of the roof is sprayed with a thermal insulation. Figure 6, shows the layout of the attic.

6.2 Survey Findings

The DSHMS of the attic was conducted by Aqua Terre personnel on August 28, 2007. One (1) building material sample was collected and submitted for PLM analysis. The results of the DSHMS are presented in the subsections of Section 6.2. Recommendations for removal procedures for the identified designated substances and hazardous materials in the mechanical room are provided in Section 7. Laboratory certificates of analysis for asbestos samples are provided in Appendix B.

6.2.1 Asbestos-Containing Materials (ACMs)

One (1) sample was collected from the mechanical room on August 28, 2007 for bulk asbestos analysis using the PLM method. Results are presented in Table 6.1. The sample identification number, sample location, description of material, friability, condition, accessibility, recommended action, asbestos content and estimated quantity (only for ACMs) are also included in Table 6.1.

Table 6.1 Summary of Asbestos Survey, mechanical room / attic

Sample ID	Room Number	Materials	Friable[1]	Condition[2]	Accessibility[3]	Action[4]	Asbestos Content[5]	Estimated Quantity
CBB1-AS-13	301	Thermal Insulation, cream colour, sprayed on ceiling	N/A	N/A	N/A	N/A	ND	1425 m^2

Notes:

[1] Friability is assessed as friable or non-friable

[2] Condition is rated as good, fair or poor

[3] Accessibility is A, B, C(exposed), C(concealed) or D as defined in Section 2.3.1.

[4] Action is 1, 2, 3, 4, 5, 6 or 7 as defined in Section 2.3.1.

[5] Asbestos Content is Chrysotile ©, Amosite (A) or Other Fibre (O) expressed as a percentage

ND None Detected (for PLM <0.1%; TEM <0.1-0.2%)

bold Asbestos Content > 0.5%

6.2.2 Lead-Containing Materials

No paint samples were collected in the mechanical area of the attic. The cream coloured paint on the walls and ceiling of this area appeared to be the same as sample CBB1-Pb-12 which contained 71 ppm of lead.

Cast iron pipe flanges likely containing leaded packing material were observed in the attic (room 301). Approximately three hundred and sixty (360) pipe flanges measuring 4 inches in diameter and seventy-two (72) pipe flanges measuring 2 inches in diameter were observed in the attic.

No other sources of lead such as lead pipe or lead wiring were identified in accessible areas during the survey by Aqua Terre.

6.2.3 Mercury

Fluorescent light bulbs contain between 0.01 to 0.04 g of mercury vapour depending on manufacturer and age (Environment Canada, 2002). The number of fluorescent light bulbs observed by Aqua Terre in the attic was approximately sixteen (16), indicating that the total amount of mercury in the bulbs in the attic could range from 0.16 to 0.64 g.

No other sources of mercury were found in the attic.

6.2.4 Silica

Silica is contained in the concrete floors and ceiling of the attic.

6.2.5 Other Designated Substances

During this survey, none of the following designated substances were observed in the pumphouse or at the exterior of the building: acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates or vinyl chloride.

6.2.6 Polychlorinated Biphenyls (PCBs)

Eight (8) fluorescent light ballasts were observed in the attic. Based on selective and representative inspection conducted on ballasts throughout the building, PCB-containing fluorescent light ballasts are likely not present in the fluorescent light fixtures in the attic.

6.2.7 Ozone Depleting Substances (ODSs)

One Hankison compressed air dryer (for the air compressor) was observed in the mechanical area of the attic. The unit contained 0.10 kg of R134A refrigerant.

6.2.8 Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified in the attic.

6.2.9 Fuel, Oil and/or Waste Oil Storage

One (1) litre of Devilbiss compressor oil and approximately 2 litres of waste oil, in a 20 litre pail, were observed in the attic.

6.2.10 Chemical Storage

Two fire extinguishers and one empty 200 litre plastic drum, which likely previously contained a glycol solution, was observed in the attic (room 301). The first extinguisher was a class 5BC, 10 lb CO_2 fire extinguisher and the second was a class 2A, water fire extinguisher. No other chemicals were observed in the attic.

6.2.11 Radioactive Materials

No radioactive materials were observed in the attic.

6.2.12 Mould

Water staining and damage was observed/detected on the ceiling and floor throughout the mechanical area of the attic.

7. SUMMARY AND RECOMMENDATIONS

This section provides a summary of the findings and recommendations for the 2007 Intrusive Designated Substances and Hazardous Materials Survey conducted at Cell Block No.1 (CBB1) of the Collins Bay Institution located at 1455 Bath Road, in the city of Kingston, Ontario.

7.1 Asbestos

The methodology used to assess the risk of exposure to building occupants was consistent with the PWGSC document entitled DM Directive 057- Asbestos Management (1997). Note that the building was not occupied by any inmates at the time of the inspection and there were no CSC personnel permanently occupying any space within the building. However, the building is used for storage and CSC personnel routinely access the building to bring/remove various items. Maintenance personnel also access the building on a regular basis. Although the intent of this assessment was to satisfy the requirements of the Occupational Health and Safety Act (OHSA) with respect to contractor notification, the recommendations are also consistent with DM Directive 057 due to the occupancy issues noted above.

Asbestos in the form of pipe insulation (straight lengths, elbows), and vinyl floor tiles was identified in CBB1. Since CBB1 is scheduled for demolition, Action 3 removal is recommended regardless of accessibility/condition for all types of ACM. Estimated costs to remove all ACM in CBB1 is approximately $95,000.

Disturbance (including removal) of confirmed or suspected ACMs (whether friable or non-friable) must be conducted in accordance with O. Reg. 838 (as amended by O. Reg. 278/05), which outlines standard practices involving the handling of asbestos-containing materials (Type 1, 2, or 3). Appropriate respiratory protection and ventilation must be utilized during demolition or modification of any asbestos-containing materials in accordance with this regulation. Disposal of ACMs should be performed in accordance with O. Reg. 347 (e.g. segregation of asbestos-containing waste, labelling of waste, disposal at a licensed waste disposal facility, etc.). Table 7.1 provides a summary of where asbestos was identified throughout Cell Block No.1, the amount of ACM identified, the specific recommended mitigation type for removal, and the estimated cost for removal. Cost for Type 3 removal of individual materials do not include costs for Type 3 enclosures. These lump sum costs are provided at the bottom of Table 7.1 and must be added to the estimated costs for each type of ACM identified in the survey.

Table 7.1 Summary of Asbestos Removal Costs

Building Level	Room	Type of ACM	Amount of ACM	Mitigation Type (1, 2 or 3)[1]	Unit Cost	Total Cost *
Basement	Service Tunnels	Aircell Insulation around piping (3" to 6" in diameter)	14 m	3	$ 60	$ 2,750
First Floor	Service Corridor	Aircell Insulation around piping (4" in diameter)	10 m	3	$ 60	
Second Floor	Service Corridor	Aircell Insulation around piping (4" in diameter)	1.5 m	3	$ 60	
First Floor	Office, Room 104	Pipe Insulation (4" to 6" in diameter)	19 m	3	$ 60	$ 2,750
First Floor	Office, Room 104	Pipe Elbow Insulation	1	2	$ 30	
First Floor	101-104, 107, 109, A3-A17, A20-A27, A29-A35, B4-B17, B19-B24, B26-B28, B30-B35	Vinyl floor tiles, 12" x 12"	807 m^2	1	$22/$m^2$	$17,754
Second Floor	C3-C16, C18-C35, D3-D29, D31-D35	Vinyl floor tiles, 12" x 12"	319 m^2	3	$22/$m^2$	$7,018
Enclosures						
Basement First Floor Second Floor	Service Tunnels and Service Corridor	Aircell Insulation (3" to 6" in diameter)	25.5 m	3	N/A	$30,000 (Lump Sum)
First Floor	Office, Room 104	Pipe Elbow Insulation (4" to 6" in diameter) Pipe Elbow Insulation	19 m	3	N/A	$10,000 (Lump Sum)

Building Level	Room	Type of ACM	Amount of ACM	Mitigation Type (1, 2 or 3)[1]	Unit Cost	Total Cost *
N/A	101-104, 107, 109, A3-A17, A20-A27, A29-A35, B4-B17, B19-B24, B26-B28, B30-B35 C3-C16, C18-C35, D3-D29, D31-D35	Vinyl floor tiles, 12" x 12"	1126 m^2	3	N/A	$25,000 (Lump Sum)

[1] Type 1, 2 and 3 work is described in section 2.3.1.

* Cost provided assumes that the asbestos removal contractor will likely charge a flat minimum fee of $2,750 per removal due to the small quantity of work typically required (i.e. if work is conducted intermittently on a "one-of" basis). However, should larger scale ACM remedial programs be undertaken (such as the removal of all, or a significant portion, of ACM in a particular room or building) costs savings could likely be realized. It is noted that under Ontario Regulation 278/05 the removal of more than 1m^2 of friable asbestos is considered to be a "Type 3" removal.

Should CSC decide not to demolish CBB1 it is recommended that an Asbestos Management Plan be prepared for the building. As an interim measure, given the presence of exposed, friable asbestos in the Service Tunnel (basement) and the Service Corridors (Rooms 108 and 201), access to these areas should be restricted by isolating them from the remainder of the building. This could be readily achieved by locking the doors at either end of the Service Corridor (Room 108) and the easternmost door of Room 201 (Range "C" - Catwalk). Warning signs should be posted at each door indicating the presence of exposed asbestos. Personnel requiring access to these areas would need to be made aware of the presence of asbestos and be trained in accordance with O. Reg. 278/05.

7.2 Lead

Lead-based paint was identified throughout Cell Block No.1. The overall condition of the majority of the painted areas was good to fair.

There is no regulatory requirement to remove lead-based paint. When completing demolition in areas with lead-based paint, work should be conducted in accordance with O. Reg. 843 (as amended by O. Reg. 109/04) (e.g. implementation of an effective Lead Control Program which details

engineering controls during removal (e.g. isolation of work area, dust control measures, containment of wash water, proper ventilation, proper hygiene practices and use of personal protective equipment, etc.). Wastes generated should be managed in accordance with O.Reg. 347 as amended.

Table 7.2 Summary of Lead-Based Paint

Building Level	Room	Location and Description	Condition	Lead Content (ppm)	Estimated Quantity (m^2)	Unit Cost ($/m^2$)	Total Cost
First Floor	101-103, 105, 107, 109, 110, 112, A3	Light blue grey paint on plastered walls and/or ceiling	Fair	45300	227	N/A	N/A
First Floor	101, 107, 109, B31, B33, B34	Teal paint on radiators, plastered walls and ceiling, stairs to second floor	Good	1310	163	N/A	N/A
First Floor	101, 107, 109, B33, B34	Burgundy paint on plaster walls and ceiling and stairs	Good	2100	125	N/A	N/A
First Floor	101, 110, 112, A3-A35, B3-B35	Dark blue grey paint on cell walls and bars	Good	3560	73	N/A	N/A
Second Floor	203, 205, 206, C3-C35, D3-D35	Light blue grey paint on plastered walls and/or ceiling	Good	45300	1447	N/A	N/A

Building Level	Room	Location and Description	Condition	Lead Content (ppm)	Estimated Quantity (m^2)	Unit Cost (/m^2)	Total Cost
Second Floor	206	Teal paint on plastered walls and ceiling, trim and the roof of room 102	Good	1310	10	N/A	N/A
Second Floor	206	Burgundy paint on plastered walls and ceiling, trim and the roof of room 103	Good	2100	11	N/A	N/A
Second Floor	203, 205, 206, C3-C35, D3-D35	Dark blue grey paint on cell walls and bars	Good	3560	70	N/A	N/A
Second Floor	C26, C29	Black paint on tiles and cell walls	Good	2400	8	N/A	N/A

Cast iron pipe flanges likely containing leaded packing material are present throughout the main building. A total of approximately 1132 pipe flanges were observed throughout the main building. Lead-containing batteries may be present in emergency lighting packs. A total of approximately 8 emergency lighting packs were observed throughout CBB1.

Prior to demolition, lead-containing materials should be segregated and disposed (or recycled) in accordance with the requirements of O. Reg. 347 (including, but not limited to, generator registration, manifest requirements, and Toxicity Characteristic Leachate Procedure (TCLP) testing for evaluation of disposal options.

7.3 Mercury

Mercury is present in Cell Block No. 1 in the form of fluorescent light tubes and a thermostat. There are approximately 387 fluorescent light tubes present in this building. In addition, one mercury-containing thermostat was observed in room 107. There are no regulatory requirements for the removal of mercury, however O. Reg. 347 regulates the disposal of mercury. All mercury-containing equipment should be recycled.

Extra care should be taken while handling fluorescent light tubes since breakage could release mercury. The tubes should be recycled. The cost to recycle the 387 fluorescent light tubes from Cell Block No.1 is estimated at approximately $300.

Prior to demolition, the mercury-containing thermostat should be placed in a non-breakable container and then in a tightly sealed plastic bag (polyethylene), and contents labelled "mercury- containing thermostat". If possible, the thermostat should be recycled through a thermostat recovery program (e.g. Honeywell's Take-Back Program) or disposed as a hazardous waste by a licensed hazardous waste disposal contractor. Common mercury waste (such as fluorescent lamps and thermostats) is not considered a subject waste under O. Reg. 347 as long it is destined for a mercury recovery facility. An MOE waste generator number and manifest would therefore not be required.

7.4 Silica

Silica is present in concrete, concrete blocks and bricks throughout Cell Block No.1 (e.g. floor/walls/ceiling in main building and the walls of the electrical vault). Silica dust could be generated during demolition through processes such as drilling, hammering, breaking, blasting, grinding, crushing, or sandblasting. When conducting demolition work of building materials containing silica, work procedures to protect workers should be implemented to comply with O. Reg. 845/90 including, but not limited to: implementation of an effective Silica Control Program detailing engineering controls during the removal (e.g. isolation of work area, dust control measures (typically wetting of work surfaces), proper ventilation, proper hygiene practices and use of personal protective equipment (typically dust masks and eye protection)).

No other designated substances were observed in CBB1 during the site inspection.

7.5 Polychlorinated Biphenyls (PCBs)

Based on selective and representative inspection conducted on ballasts throughout the building, PCB-containing fluorescent light ballasts are likely not present in Cell Block No.1. No other potential PCB-containing equipment was identified in CBB1.

7.6 Ozone-Depleting Substances (ODS)

Three (3) pieces of ODS-containing equipment were identified in CBB1 and have been included in an updated Halocarbon Inventory for the institution. All decommissioning of equipment containing halocarbons must be performed in accordance with the Federal Halocarbon Regulations (SOR/2003-289) and O. Reg. 189/04. The latter assumes that none of this equipment can be re-used elsewhere.

Specifically, any of the air dryers or refrigerators which cannot be re-used elsewhere should be clearly identified as "out of service" and be relocated to a common area at the facility prior to start of demolition. A licensed contractor should then be retained to remove the refrigerant from each piece of equipment. The scrapped equipment should then be disposed off-site (preferably through a bulk metal recycler such as Kimco Steel Sales, Kingston, ON).

Table 7.3 Summary of Halocarbon Equipment

Building Level	Quantity	Equipment Type	Refrigerant	Amount[1] (kg)
First Floor	1	Refrigerator	R134a	0.109
First Floor	1	Refrigerator	R12	0.135
Mechanical Room	1	Air dryer	R134a	0.4

Notes:

[1] Amount of refrigerant recorded in kg unless specified otherwise

7.7 Urea Formaldehyde Foam Insulation (UFFI)

No UFFI was identified in the main building or the Electrical Vault.

7.8 Fuel, Oil and Waste Oil Storage

There is one (1) 1 L container of Devilbiss compressor oil and approximately 2 L of waste oil located in the mechanical room in the attic of Cell Block No.1.

Prior to the start of demolition, the compressor oil and waste oil should be disposed off-site through CSC's waste disposal program in accordance with the requirements of O.Reg. 347 (a small quantity exemption would apply for the disposal of <25 L per month).

7.9 Chemical Storage

A list of chemicals observed in Cell Block No.1 is provided in the following table. The items detailed in this table should be consolidated prior to demolition. Items that are in acceptable condition and can be reused such as fire extinguishers should be relocated accordingly to other buildings. Any materials that cannot be recycled/reused should be disposed off-site by a provincially approved waste hauler in accordance with O. Reg. 347 (e.g. generator registration, use of waste manifest, etc.).

Table 7.4 Summary of Chemical Storage

Building Level	Room	Chemicals
First Floor	101	- 3 x 5 lb fire extinguisher (dry chemical)
First Floor	102	- 1 x 10 lb fire extinguisher (CO_2)
Attic	Mechanical Room 301	- 1 x 10 lb fire extinguisher (CO_2) - 1 x 2 gallon fire extinguisher (water)

7.10 Radioactive Materials

No radioactive materials were observed in Cell Block No.1.

7.11 Mould

Water damage and/or mould was observed throughout the service tunnels and in the mechanical room in the attic. Appropriate respiratory protection (e.g. HEPA cartridge respirator) and clothing (Tyvek) should be utilized by demolition workers in accordance with the demolition program's health and safety plan, the Canadian Standards Association Manual for the Selection , Use, and Care of Respirators (CSA Z94.4-02), and the Environmental Abatement Council of Ontario's Mould Abatement Guidelines (EACO, Edition 1, 2004).

7.12 Additional Considerations

Several old desks, filing and storage cabinets, chairs, lockers, new cell mattresses**,** and miscellaneous office supplies are present throughout the building. The office furniture, supplies and mattresses should be removed prior to demolition.

8. REFERENCES

CSA, 2002. "Manual for the Selection, Use, and Care of Respirators (CSA Z94.4-02)", Canadian Standards Association, October 2002.

EACO, 2004. "Mould Abatement Guidelines - Edition 1", Environmental Abatement Council of Ontario, 2004.

XCG, 2002. "Designated Substances and Hazardous Materials Survey - Collins Bay Institution Kingston, Ontario", September 26, 2002.

We trust that this report fulfills your current requirements. Do not hesitate to contact us should you have any questions or comments.

Sincerely,

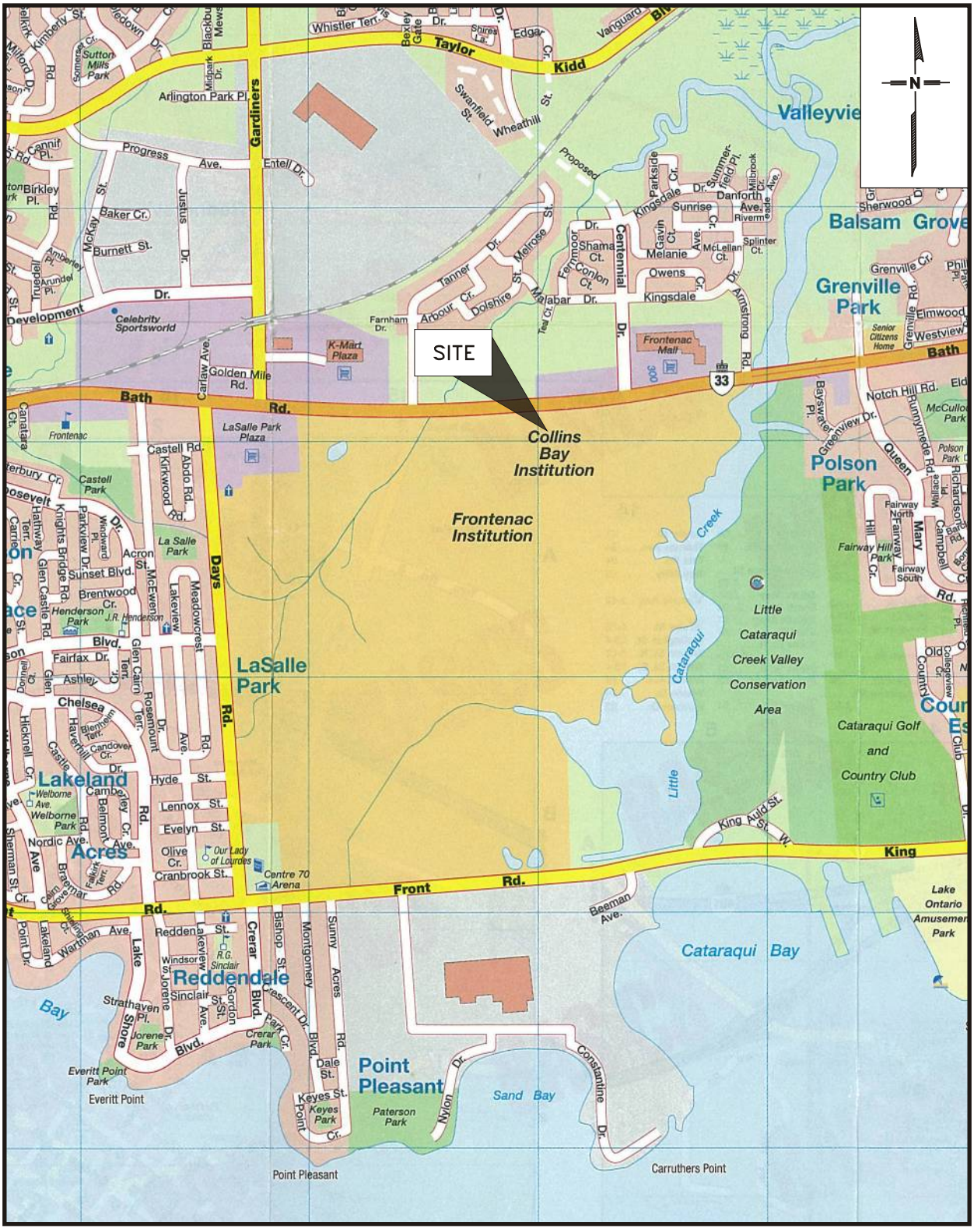
Aqua Terre Solutions Inc.,

Cory van Hoof
Project Scientist

Mark Foerster, P.Geo.
Project Manager

Kevin Strank
Environmental Analyst

FIGURES



NOTE(S):
1. SCALE IS APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED OR FAXED

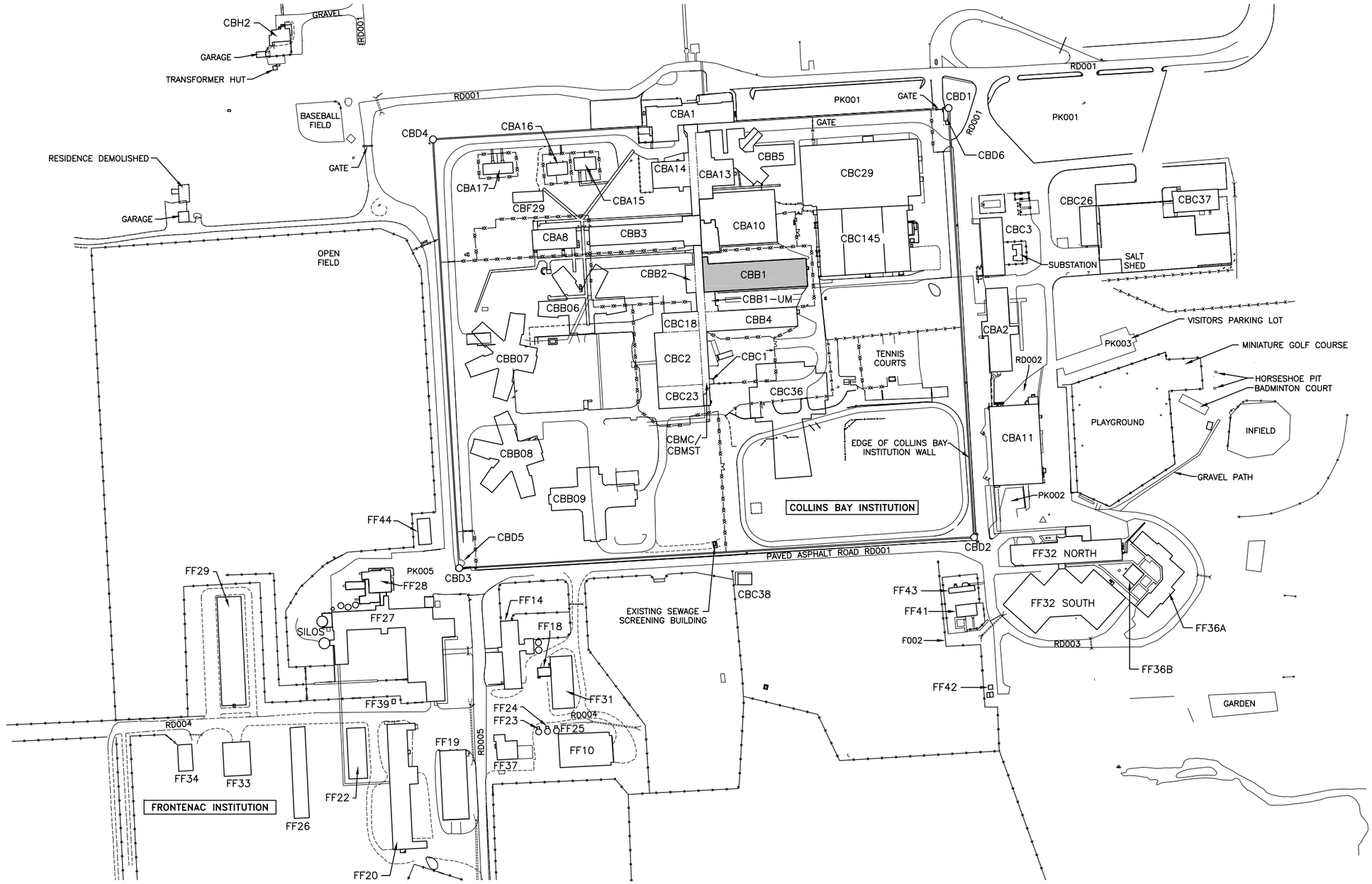
SCALE 1:25,000

0 500 1000m

AQUA TERRE

Client/Location: PWGSC COLLINS BAY INSTITUTION KINGSTON, ONTARIO		Title: SITE LOCATION	
Project No: 07120	Filename: 07120-KNG-CB-1.CDR	Date: OCTOBER 2007	Dwg No: FIGURE 1
Drawn/Design: EM	Verified: CVH	Project Manager: MRF	

KEY PLAN – COLLINS BAY INSTITUTION



COLLINS BAY INSITUTION BUILDING INDEX	
ID	DESCRIPTION
CBA1	ADMINISTRATION BUILDING
CBA2	REGIONAL PHARMACY & PWGSC OFFICE
CBA8	PROTESTANT CHAPEL BUILDING
CBA10	RECREATION BUILDING
CBA11	REGIONAL STORES BUILDING
CBA13	ADMISSION & DISCHARGE BUILDING
CBA14	MEDICAL CENTER
CBA15	FAMILY VISITING DUPLEX (#1 & #2)
CBA16	FAMILY VISITING DUPLEX (#3 & #4)
CBA17	FAMILY VISITING DUPLEX (#5 & #6)
CBB1-UM	UNIT MANAGEMENT OFFICES
CBB1	CELL BLOCK NO. 1
CBB2	CELL BLOCK NO. 2 – 80% DEMOLISHED
CBB3	CELL BLOCK NO. 3
CBB4	CELL BLOCK NO. 4
CBB5	DISSOCIATION / SEGREGATION BUILDING
CBB06	CELL UNIT
CBB07	CELL UNIT
CBB08	CELL UNIT
CBB09	APARTMENT UNIT
CBC1	CHANGE & S.I.S. BUILDING – 95% DEMOLISHED
CBC2	MAIN KITCHEN BUILDING
CBC3	CENTRAL HEATING PLANT
CBC18	DINING HALL
CBC23	INMATE DINING HALL
CBC26	FLAMMABLE STORAGE BUILDING
CBC29	EVI NORTH BUILDING
CBC36	PROGRAMS BUILDING
CBC37	REGIONAL GARAGE
CBC38	SEWAGE SCREENING BUILDING
CBC145	EVI SOUTH BUILDINGS
CBD1	SECURITY TOWER (N-E CORNER)
CBD2	SECURITY TOWER (S-E CORNER)
CBD3	SECURITY TOWER (S-W CORNER)
CBD4	SECURITY TOWER (N-W CORNER)
CBD5	SALLY PORT (S-W CORNER)
CBD6	SALLY PORT (N-E CORNER)
CBF29	STORAGE BUILDING
CBH2	BRIDGE HOUSE
CBMC	MAIN CORRIDOR
CBMST	MAIN SERVICE TUNNEL

LEGEND

SECURITY FENCE

FENCE

SUBJECT BUILDING

SCALE 1:3000

0 50 100m

KEY PLAN

Public Works
Government Services Canada
Ontario Region

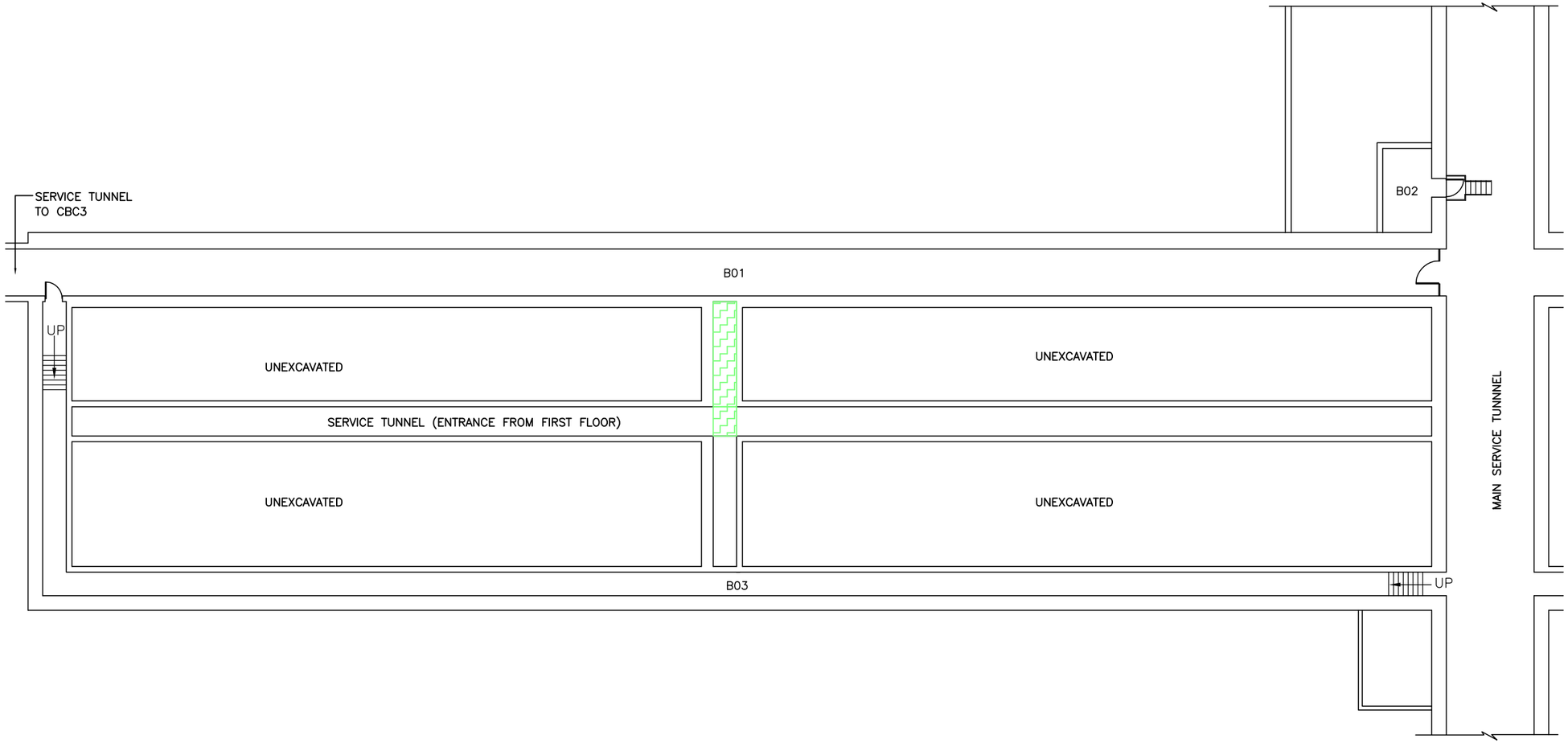
Travaux publics
Services gouvernementaux Canada
Région de l'Ontario

NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED OR FAXED
3. BUIDLING IDENTIFICATION WITH PREFIX "FF' IS FOR THE FRONTENAC INSTITUTION

SOURCE(S):
1. PUBLIC WORKS AND GOVERNMENT SERVICES CANADA, KEY PLAN, REF #74476, MARCH 18, 2005

AQUA TERRE

Client/Location: PWGSC COLLINS BAY INSTITUTION KINGSTON, ONTARIO		Title: COLLINS BAY INSTITUTION KEY PLAN	
Project No: 07120	Filename: 07120-KP-CBB1-1.DWG	Date: OCTOBER 2007	Dwg No: FIGURE 2
Drawn: EM	Verified: CVH	Project Manager: MRF	



BASEMENT & TUNNEL LEVEL

B01	SERVICE TUNNEL
B02	ELEVATOR SERVICE PIT
B03	SERVICE TUNNEL

LEGEND

- FLOOR TILE SAMPLE LOCATION
- CEILING TILE SAMPLE LOCATION
- PAINT SAMPLE LOCATION
- PAINT SAMPLE LOCATION CONTAINING LEAD AS SAMPLED BY XCG & OBSERVED BY AQUA TERRE (2007)
- WALL OR CEILING SURFACING MATERIAL SAMPLE LOCATION
- PIPE INSULATION SAMPLE LOCATION
- MERCURY CONTAINING THERMOSTAT
- LEAD CONTAINING PAINT ON WALL (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON FLOOR (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON CEILING (>0.06%/600ppm)
- ASBESTOS CONTAINING FLOOR TILES
- ASBESTOS CONTAINING CEILING TILES OR SURFACE MATERIAL
- ASBESTOS CONTAINING PIPING INSULATION & PARGING MATERIAL
- (Pb=921ppm) EXCEEDANCE IN ANALYSED SAMPLE

SERVICE TUNNEL PLAN

SCALE 1:250

0 5 10m

Public Works
Government Services Canada
Ontario Region

Travaux publics
Services gouvernementaux Canada
Région de l'Ontario

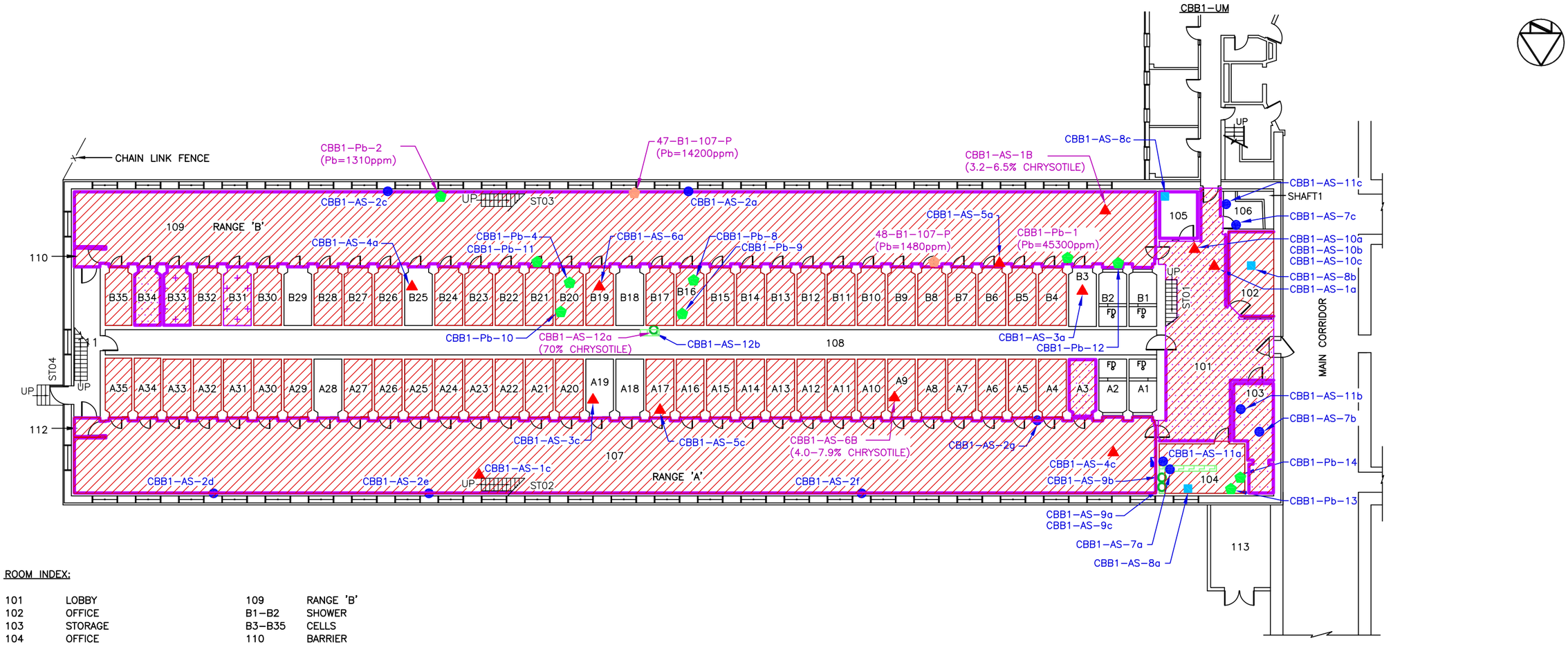
NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED OR FAXED
3. 'ppm': PARTS PER MILLION
4. 'Pb': LEAD

SOURCE(S):
1. PUBLIC WORKS AND GOVERNMENT SERVICES CANADA, CBB1 CELL BLOCK No. 1, SERVICE TUNNEL FIRE PLAN, DECEMBER 1, 2004

AQUA TERRE

Client/Location: PWGSC, COLLINS BAY INSTITUTION, KINGSTON, ONTARIO		Title: SAMPLING LOCATIONS – CBB1 CELL BLOCK No. 1 (SERVICE TUNNEL)	
Project No: 07120	Filename: 07120-CBB1-BSMT-2	Date: NOVEMBER 2007	Dwg No: FIGURE 3
Drawn: EM	Verified: CVH	Project Manager: MRF	

CBB1 CELL BLOCK No. 1



ROOM INDEX:

101	LOBBY	109	RANGE 'B'
102	OFFICE	B1–B2	SHOWER
103	STORAGE	B3–B35	CELLS
104	OFFICE	110	BARRIER
105	OFFICE	111	EXIT – CORRIDOR
106	WASHROOM	112	BARRIER
107	RANGE 'A'	113	ELECTRICAL VAULT
A1–A2	SHOWER		
A3–A35	CELLS	ST01	STAIR NO. #1
108	SERVICE CORRIDOR	ST02	STAIR NO. #2
		ST03	STAIR NO. #3
		ST04	STAIR NO. #4

LEGEND

- FLOOR TILE SAMPLE LOCATION
- CEILING TILE SAMPLE LOCATION
- PAINT SAMPLE LOCATION
- PAINT SAMPLE LOCATION CONTAINING LEAD AS SAMPLED BY XCG & OBSERVED BY AQUA TERRE (2007)
- WALL OR CEILING SURFACING MATERIAL SAMPLE LOCATION
- PIPE INSULATION SAMPLE LOCATION
- MERCURY CONTAINING THERMOSTAT
- LEAD CONTAINING PAINT ON WALL (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON FLOOR (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON CEILING (>0.06%/600ppm)
- ASBESTOS CONTAINING FLOOR TILES
- ASBESTOS CONTAINING CEILING TILES OR SURFACE MATERIAL
- ASBESTOS CONTAINING PIPING INSULATION & PARGING MATERIAL
- (Pb=921ppm) EXCEEDANCE IN ANALYSED SAMPLE

SCALE 1:250

0 5 10m

FIRST FLOOR PLAN

Public Works
Government Services Canada
Ontario Region

Travaux publics
Services gouvernementaux Canada
Région de l'Ontario

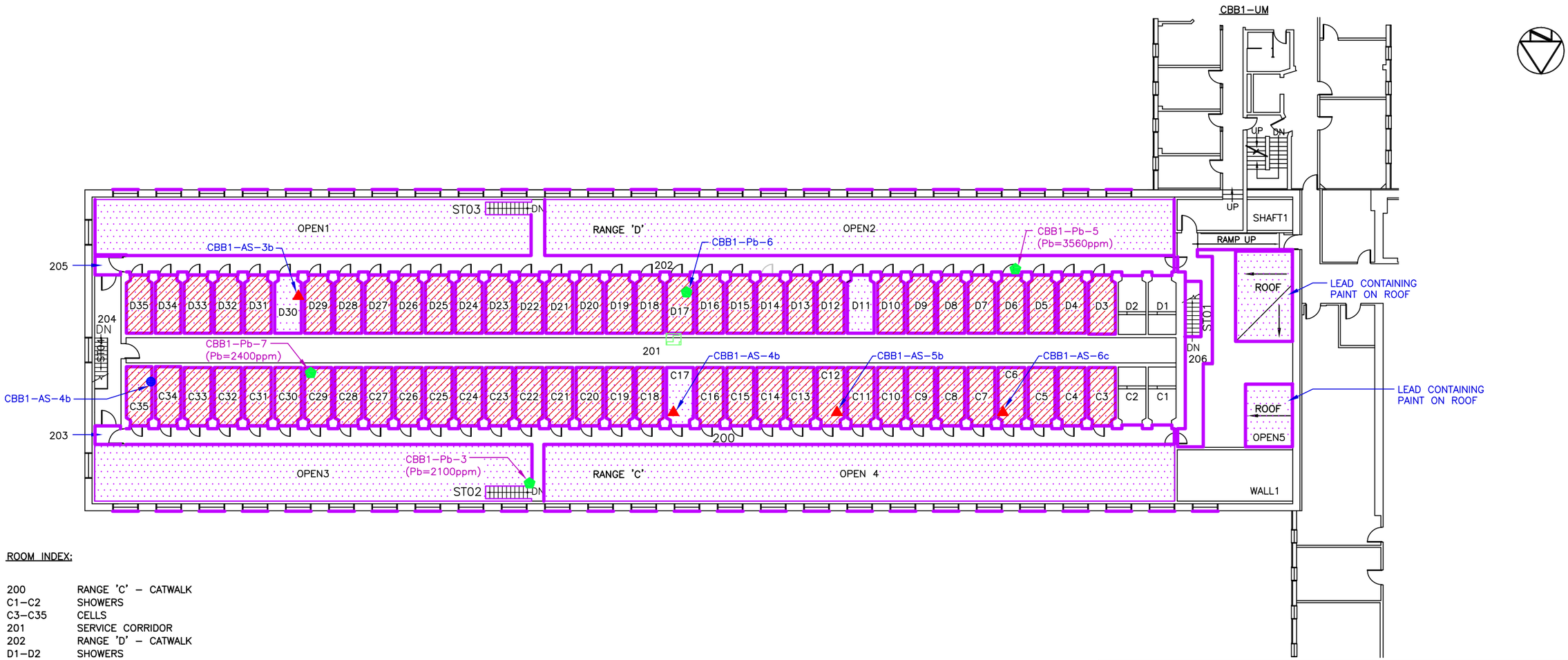
NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED OR FAXED
3. 'ppm': PARTS PER MILLION
4. 'Pb': LEAD

SOURCE(S):
1. PUBLIC WORKS AND GOVERNMENT SERVICES CANADA, CBB1 CELL BLOCK No. 1, FIRST FLOOR FIRE PLAN, DECEMBER 1, 2004

AQUA TERRE

Client/Location: PWGSC, COLLINS BAY INSTITUTION, KINGSTON, ONTARIO		Title: SAMPLING LOCATIONS – CBB1 CELL BLOCK No. 1 (FIRST FLOOR)	
Project No: 07120	Filename: 07120-CBB1-1FLR-2	Date: NOVEMBER 2007	Dwg No: FIGURE 4
Drawn: EM	Verified: CVH	Project Manager: MRF	

CBB1 CELL BLOCK No. 1



ROOM INDEX:

200	RANGE 'C' – CATWALK		
C1–C2	SHOWERS		
C3–C35	CELLS		
201	SERVICE CORRIDOR		
202	RANGE 'D' – CATWALK		
D1–D2	SHOWERS		
D3–D35	CELLS		
203	BARRIER		
204	FIRE EXIT		
205	BARRIER		
206	FIRE EXIT/CORRIDOR		
		OPEN1	OPEN 1
ST01	STAIR NO. #1	OPEN2	OPEN 2
ST02	STAIR NO. #2	OPEN3	OPEN 3
ST03	STAIR NO. #3	OPEN4	OPEN 4
ST04	STAIR NO. #4	OPEN5	OPEN 5

LEGEND

- FLOOR TILE SAMPLE LOCATION
- CEILING TILE SAMPLE LOCATION
- PAINT SAMPLE LOCATION
- PAINT SAMPLE LOCATION CONTAINING LEAD AS SAMPLED BY XCG & OBSERVED BY AQUA TERRE (2007)
- WALL OR CEILING SURFACING MATERIAL SAMPLE LOCATION
- PIPE INSULATION SAMPLE LOCATION
- MERCURY CONTAINING THERMOSTAT
- LEAD CONTAINING PAINT ON WALL (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON FLOOR (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON CEILING (>0.06%/600ppm)
- ASBESTOS CONTAINING FLOOR TILES
- ASBESTOS CONTAINING CEILING TILES OR SURFACE MATERIAL
- ASBESTOS CONTAINING PIPING INSULATION & PARGING MATERIAL
- (Pb=921ppm) EXCEEDANCE IN ANALYSED SAMPLE

SCALE 1:250
0 5 10m

SECOND FLOOR PLAN

Public Works Government Services Canada
Ontario Region

Travaux publics Services gouvernementaux Canada
Région de l'Ontario

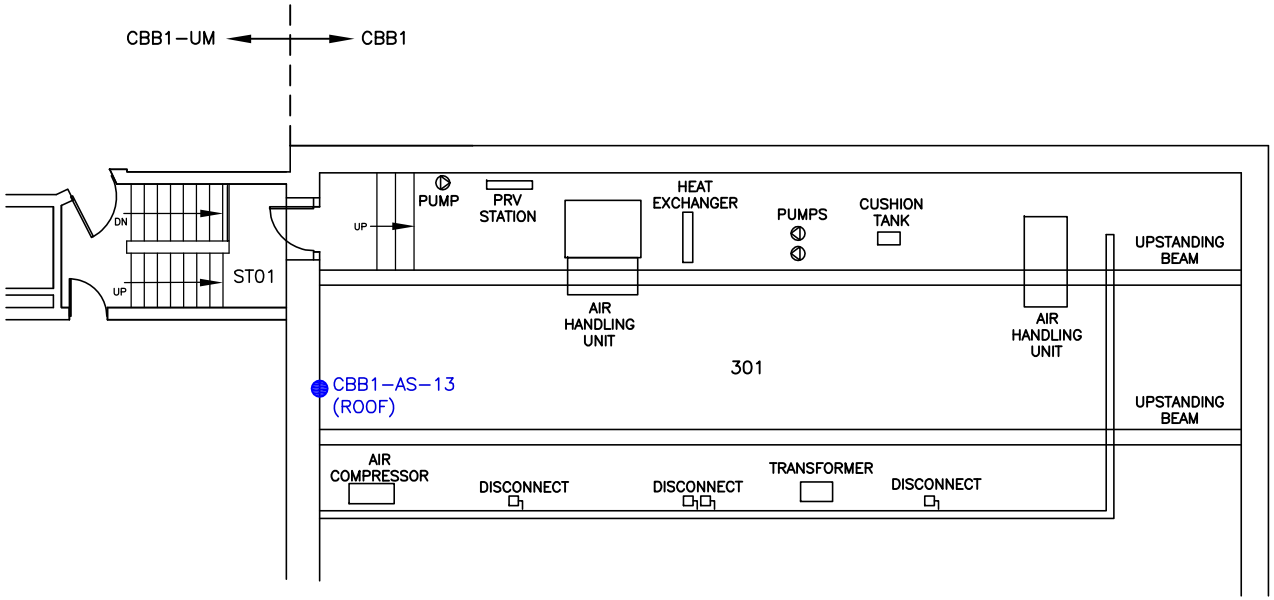
NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED OR FAXED
3. 'ppm': PARTS PER MILLION
4. 'Pb': LEAD

SOURCE(S):
1. PUBLIC WORKS AND GOVERNMENT SERVICES CANADA, CBB1 CELL BLOCK No. 1, SECOND FLOOR FIRE PLAN, DECEMBER 1, 2004

AQUA TERRE

Client/Location: PWGSC COLLINS BAY INSTITUTION KINGSTON, ONTARIO		Title: SAMPLING LOCATIONS – CBB1 CELL BLOCK No. 1 (SECOND FLOOR)	
Project No: 07120	Filename: 07120–CBB1–2FLR–2	Date: NOVEMBER 2007	Dwg No: FIGURE 5
Drawn: EM	Verified: CVH	Project Manager: MRF	

CBB1 CELL BLOCK No1.



LEGEND

- FLOOR TILE SAMPLE LOCATION
- CEILING TILE SAMPLE LOCATION
- PAINT SAMPLE LOCATION
- PAINT SAMPLE LOCATION CONTAINING LEAD AS SAMPLED BY XCG & OBSERVED BY AQUA TERRE (2007)
- WALL OR CEILING SURFACING MATERIAL SAMPLE LOCATION
- PIPE INSULATION SAMPLE LOCATION
- MERCURY CONTAINING THERMOSTAT
- LEAD CONTAINING PAINT ON WALL (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON FLOOR (>0.06%/600ppm)
- LEAD CONTAINING PAINT ON CEILING (>0.06%/600ppm)
- ASBESTOS CONTAINING FLOOR TILES
- ASBESTOS CONTAINING CEILING TILES OR SURFACE MATERIAL
- ASBESTOS CONTAINING PIPING INSULATION & PARGING MATERIAL
- (Pb=921ppm) EXCEEDANCE IN ANALYSED SAMPLE

ROOM INDEX

301 MECHANICAL ROOM

NOTE(S):
1. SCALE AND SITE INFRASTRUCTURE LOCATIONS ARE APPROXIMATE
2. INFORMATION ON THIS FIGURE MAY BE LOST IF IT IS PHOTOCOPIED OR FAXED
3. 'ppm': PARTS PER MILLION
4. 'Pb': LEAD

SOURCE(S):
1. PUBLIC WORKS AND GOVERNMENT SERVICES CANADA, CBB1 CELL BLOCK No. 1, THIRD FLOOR FIRE PLAN, OCTOBER 18, 2007

SCALE 1:150

0 1 2 3 6m

THIRD FLOOR (ATTIC)

Public Works
Government Services Canada
Ontario Region

Travaux publics
Services gouvernementaux Canada
Région de l'Ontario

AQUA TERRE

Client/Location: PWGSC, COLLINS BAY INSTITUTION, KINGSTON, ONTARIO		Title: SAMPLING LOCATIONS – CBB1 CELL BLOCK No. 1 (THIRD FLOOR – ATTIC)	
Project No: 07120	Filename: 07120–CBB1–3FLR–2	Date: NOVEMBER 2007	Dwg No: FIGURE 6
Drawn: EM	Verified: CVH	Project Manager: MRF	

APPENDIX A

PHOTOGRAPHS

PHOTO 1: USED OFFICE FURNITURE IN ROOM 101 (img_2407.jpg)

PHOTO 2: RANGE B (ROOM 109) LOOKING EAST (img_2335.jpg)

AQUA TERRE	Client/Location: PWGSC COLLINS BAY INSTITUTION KINGSTON, ONTARIO		Title: SITE PHOTOGRAPHS
	Project No: 07120	Filename: 07120-CBB1-P1-2.CDR	Date: OCTOBER 2007
	Drawn/Design: EM	Verified: CVH/KS	Project Manager: MRF
			Dwg No: APPENDIX A

PHOTO 3: PIPE CHASE IN ROOM 104 (img_2378.jpg)

PHOTO 4: PIPE CHASE (INTERIOR) IN ROOM 104 (img_2339.jpg)

AQUA TERRE	Client/Location: PWGSC COLLINS BAY INSTITUTION KINGSTON, ONTARIO		Title: SITE PHOTOGRAPHS
	Project No: 07120	Filename: 07120-CBB1-P3-4.CDR	Date: OCTOBER 2007
	Drawn/Design: EM	Verified: CVH/KS	Project Manager: MRF
			Dwg No: APPENDIX A

PHOTO 5: NEW MATTRESSES IN ROOM 107 (img_2404.jpg)

PHOTO 6: MERCURY THERMOSTAT IN ROOM 107 (img_2403.jpg)

AQUA TERRE

Client/Location: PWGSC COLLINS BAY INSTITUTION KINGSTON, ONTARIO		Title: SITE PHOTOGRAPHS	
Project No: 07120	Filename: 07120-CBB1-P5-6.CDR	Date: OCTOBER 2007	Dwg No: APPENDIX A
Drawn/Design: EM	Verified: CVH/KS	Project Manager: MRF	

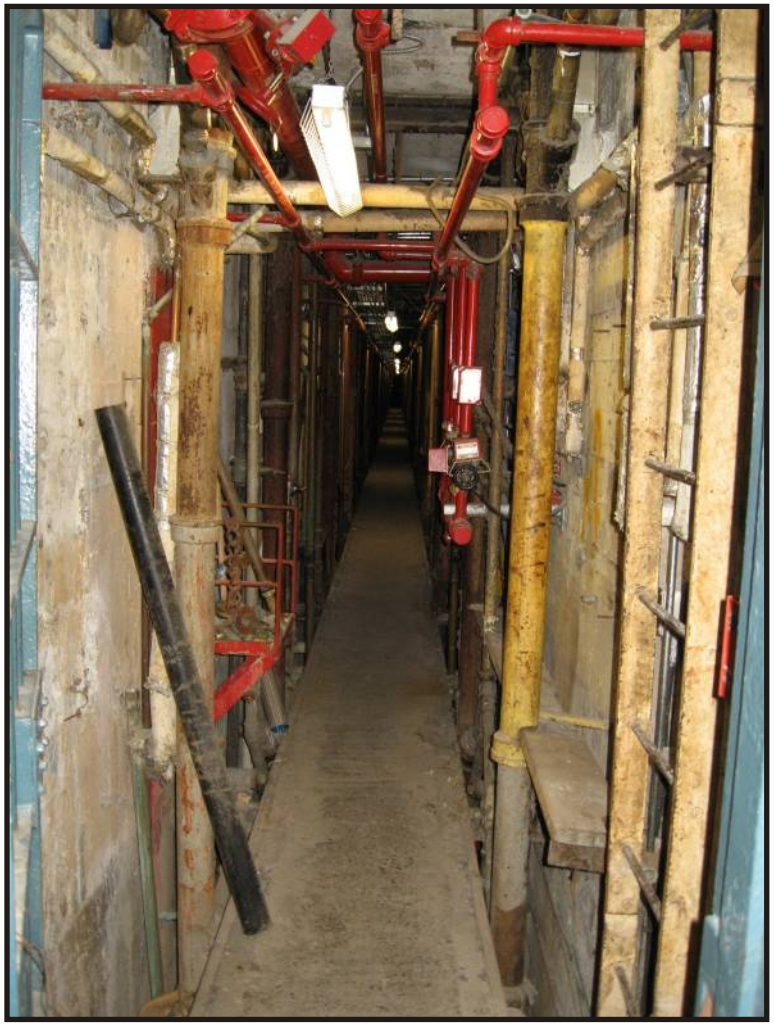


PHOTO 7: FIRST FLOOR SERVICE CORRIDOR ROOM 108 (img_2392.jpg)

PHOTO 8: AIRCELL PIPE INSULATION (70% CHRYSOTILE) IN POOR CONDITION ROOM 108 (img_2416.jpg)

AQUA TERRE

Client/Location: PWGSC, COLLINS BAYS INSTITUTION, KINGSTON, ONTARIO		Title: SITE PHOTOGRAPHS	
Project No: 07120	Filename: 07120-CBB1-P7-8.CDR	Date: OCTOBER 2007	Dwg No: APPENDIX A
Drawn/Design: EM	Verified: MH	Project Manager: MRF	

PHOTO 9: BASEMENT SERVICE TUNNEL TO CBC 3 ROOM B01 (img_1207.jpg)

PHOTO 10: BASEMENT SERVICE TUNNEL (img_2423.jpg)

AQUA TERRE

Client/Location: PWGSC, COLLINS BAYS INSTITUTION, KINGSTON, ONTARIO		Title: SITE PHOTOGRAPHS	
Project No: 07120	Filename: 07120-CBB1-P9-10.CDR	Date: OCTOBER 2007	Dwg No: APPENDIX A
Drawn/Design: EM	Verified: MH	Project Manager: MRF	

APPENDIX B

CERTIFICATE OF ANALYSIS - ACMs

Solutions for a Working World

Company:	Aqua Terre Solutions Inc.	**Report Date:**	11-Sep-07
Contact:	Mr. Mark Foerster	**Analysis Date:**	10-Sep-07
Client Address:	2 Gurdwara Road, Suite 200, Ottawa, ON	**Received Date:**	04-Sep-07
Client Reference:	Collin's Bay / 07-120 Cell Block 1	**LEX Project Number:**	08072000
Sampling Date:	29-Aug-07	**Number of Analyses:**	29

Analysis Requested **Bulk Asbestos by PLM**

Analysis was performed in accordance with the method EPA/600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials adopted in Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations - made under the Occupational Health and Safety Act Ontario Regulation 278/05. LEX Scientific Inc. is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP 101949) by the National Institute of Standards and Technology for analysis of bulk materials for asbestos.

German Leal, B.Sc.
Laboratory Manager

			Fibrous Asbestos Content %	Other Materials Content %
Client Sample:	CBB1-AS-2a	**Asbestos Detected?**	**No**	
LEX Sample:	01.1	**Chrysotile:**	None Detected	**Cellulose:** None Detected
Layers Analyzed:	Top Coat	**Amosite:**	None Detected	**MMVF:** None Detected
Colour:	White	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description:	Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:** 100
		Comments:		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample: CBB1-AS-2a	**Asbestos Detected?**	**No**			
LEX Sample: 01.2	**Chrysotile:**	None Detected	**Cellulose:**	1	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	99	
	Comments:				
Client Sample: CBB1-AS-2b	**Asbestos Detected?**	**No**			
LEX Sample: 02.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Top Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2b	**Asbestos Detected?**	**No**			
LEX Sample: 02.2	**Chrysotile:**	None Detected	**Cellulose:**	1	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	99	
	Comments:				
Client Sample: CBB1-AS-2c	**Asbestos Detected?**	**No**			
LEX Sample: 03.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Top Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2c	**Asbestos Detected?**	**No**			
LEX Sample: 03.2	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst 

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample: CBB1-AS-2d	**Asbestos Detected?**	**No**			
LEX Sample: 04.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Top Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2d	**Asbestos Detected?**	**No**			
LEX Sample: 04.2	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2e	**Asbestos Detected?**	**No**			
LEX Sample: 05.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Top Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2e	**Asbestos Detected?**	**No**			
LEX Sample: 05.2	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2f	**Asbestos Detected?**	**No**			
LEX Sample: 06.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Top Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst 

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample: CBB1-AS-2f	**Asbestos Detected?**	**No**			
LEX Sample: 06.2	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2g	**Asbestos Detected?**	**Yes**			
LEX Sample: 07.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Top Coat	**Amosite:**	<0.5	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-2g	**Asbestos Detected?**	**No**			
LEX Sample: 07.2	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Base Coat	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Plaster	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-7a	**Asbestos Detected?**	**No**			
LEX Sample: 08.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Matrix	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Drywall	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-7a	**Asbestos Detected?**	**No**			
LEX Sample: 08.2	**Chrysotile:**	None Detected	**Cellulose:**	60	
Layers Analyzed: Jacket	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Brown/Cream	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Drywall	**Other Amphiboles:**	None Detected	**Non Fibers:**	40	
	Comments:				

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst 

		Fibrous Asbestos Content %		Other Materials Content %	
Client Sample: CBB1-AS-7b	**Asbestos Detected?**	**No**			
LEX Sample: 09.1	**Chrysotile:**	None Detected	**Cellulose:**	None Detected	
Layers Analyzed: Matrix	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Drywall	**Other Amphiboles:**	None Detected	**Non Fibers:**	100	
	Comments:				
Client Sample: CBB1-AS-7b	**Asbestos Detected?**	**No**			
LEX Sample: 09.2	**Chrysotile:**	None Detected	**Cellulose:**	50	
Layers Analyzed: Jacket	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Brown/White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Drywall	**Other Amphiboles:**	None Detected	**Non Fibers:**	50	
	Comments:				
Client Sample: CBB1-AS-7c	**Asbestos Detected?**	**No**			
LEX Sample: 10.1	**Chrysotile:**	None Detected	**Cellulose:**	5	
Layers Analyzed: Matrix	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Drywall	**Other Amphiboles:**	None Detected	**Non Fibers:**	95	
	Comments:				
Client Sample: CBB1-AS-7c	**Asbestos Detected?**	**No**			
LEX Sample: 10.2	**Chrysotile:**	None Detected	**Cellulose:**	50	
Layers Analyzed: Jacket	**Amosite:**	None Detected	**MMVF:**	None Detected	
Colour: Brown/White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Drywall	**Other Amphiboles:**	None Detected	**Non Fibers:**	50	
	Comments:				
Client Sample: CBB1-AS-8a	**Asbestos Detected?**	**No**			
LEX Sample: 11	**Chrysotile:**	None Detected	**Cellulose:**	40	
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:**	40	
Colour: Grey/White	**Crocidolite:**	None Detected	**Other Fibers:**	None Detected	
Description: Ceiling Tile	**Other Amphiboles:**	None Detected	**Non Fibers:**	20	
	Comments:				

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst 

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: CBB1-AS-8b	**Asbestos Detected?**	**No**	
LEX Sample: 12	**Chrysotile:**	None Detected	**Cellulose:** 50
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** 25
Colour: Grey/White	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Ceiling Tile	**Other Amphiboles:**	None Detected	**Non Fibers:** 25
	Comments:		
Client Sample: CBB1-AS-8c	**Asbestos Detected?**	**No**	
LEX Sample: 13	**Chrysotile:**	None Detected	**Cellulose:** 50
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** 30
Colour: Grey/White	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Ceiling Tile	**Other Amphiboles:**	None Detected	**Non Fibers:** 20
	Comments:		
Client Sample: CBB1-AS-9a	**Asbestos Detected?**	**Yes**	
LEX Sample: 14	**Chrysotile:**	None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample homogenized	**Amosite:**	90	**MMVF:** None Detected
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Pipe Insulation	**Other Amphiboles:**	None Detected	**Non Fibers:** 10
	Comments:		
Client Sample: CBB1-AS-11a	**Asbestos Detected?**	**No**	
LEX Sample: 17	**Chrysotile:**	None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** None Detected
Colour: Cream/Green	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Joint Compound	**Other Amphiboles:**	None Detected	**Non Fibers:** 100
	Comments:		
Client Sample: CBB1-AS-11b	**Asbestos Detected?**	**No**	
LEX Sample: 18	**Chrysotile:**	None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** None Detected
Colour: Cream/Pink	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Joint Compound	**Other Amphiboles:**	None Detected	**Non Fibers:** 100
	Comments:		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst 

		Fibrous Asbestos Content %	Other Materials Content %
Client Sample: CBB1-AS-11c	**Asbestos Detected?**	**No**	
LEX Sample: 19	**Chrysotile:**	None Detected	**Cellulose:** 3
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** None Detected
Colour: Cream	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Joint Compound	**Other Amphiboles:**	None Detected	**Non Fibers:** 97
	Comments:		
Client Sample: CBB1-AS-12a	**Asbestos Detected?**	**Yes**	
LEX Sample: 20	**Chrysotile:**	70	**Cellulose:** None Detected
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** None Detected
Colour: Grey	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Pipe Insulation	**Other Amphiboles:**	None Detected	**Non Fibers:** 30
	Comments:		
Client Sample: CBB1-AS-13	**Asbestos Detected?**	**No**	
LEX Sample: 23	**Chrysotile:**	None Detected	**Cellulose:** None Detected
Layers Analyzed: Sample homogenized	**Amosite:**	None Detected	**MMVF:** 60
Colour: Cream	**Crocidolite:**	None Detected	**Other Fibers:** None Detected
Description: Thermal Insulation	**Other Amphiboles:**	None Detected	**Non Fibers:** 40
	Comments:		

Other Amphiboles: ac=actinolite, a=anthophyllite, t-tremolite, u=unidentified
MMVF: Man Made Vitreous Fibers: Fiberglass, Min. Wool, Rockwool, Glasswool
PLM - method detection limit is 0.1%

Analyst

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

Attn: **Nancy Cluthe**
Lex Scientific
2 Quebec Street
Suite 204
Guelph, Ontario, Canada N1H-2T3

Fax: Phone: (519) 824-7082

Project: **11071991/COLLINS BAY/07-120 CBB1**

Customer ID: LEXS50
Customer PO: G1180
Received: 09/05/07 9:25 AM
EMSL Order: 040722005

EMSL Proj:
Analysis Date: 9/7/2007
Report Date: 9/8/2007

Asbestos Analysis of Bulk Materials via Transmission Electron Microscopy. Chatfield Method (rev 2)

SAMPLE ID	COLOR	MATRIX MATERIAL	NON-ASBESTOS FIBERS	ASBESTOS RANGE	ASBESTOS TYPE	ASBESTOS AVG	
CBB1-AS-1A *040722005-0001*	Gray	100.0%	ND		ND		
CBB1-AS-1B *040722005-0002*	Gray	95.1%		3.2-6.5%	Chrysotile	4.9%	
CBB1-AS-1C *040722005-0003*	Gray	%					Not Analyzed
CBB1-AS-3A *040722005-0004*	Gray	100.0%	ND		ND		
CBB1-AS-3B *040722005-0005*	Gray	100.0%	ND		ND		
CBB1-AS-3C *040722005-0006*	Gray	100.0%	ND		ND		
CBB1-AS-4A *040722005-0007*	White	100.0%	ND		ND		
CBB1-AS-4B *040722005-0008*	White	100.0%	ND		ND		
CBB1-AS-4C *040722005-0009*	White	100.0%	ND		ND		
CBB1-AS-5A *040722005-0010*	Gray	100.0%	ND		ND		
CBB1-AS-5B *040722005-0011*	Gray	100.0%	ND		ND		

Analyst(s)

Steve Siegel (18)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

EMSL Analytical, Inc.
107 Haddon Ave., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4960 Email: westmontasblab@EMSL.com

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Asbestos Analysis of Bulk Materials via Transmission Electron Microscopy. Chatfield Method (rev 2)

SAMPLE ID	COLOR	MATRIX MATERIAL	NON-ASBESTOS FIBERS	ASBESTOS RANGE	ASBESTOS TYPE	ASBESTOS AVG	
CBB1-AS-5C *040722005-0012*	Gray	100.0%	ND		ND		
CBB1-AS-6A *040722005-0013*	Gray	100.0%	ND		ND		
CBB1-AS-6B *040722005-0014*	Beige	94.1%		4.0-7.9%	Chrysotile	5.9%	
CBB1-AS-6C *040722005-0015*	Beige	%					Not Analyzed
CBB1-AS-10A *040722005-0016*	Green	100.0%	ND		ND		
CBB1-AS-10B *040722005-0017*	Green	100.0%	ND		ND		
CBB1-AS-10C *040722005-0018*	Green	100.0%	ND		ND		

Analyst(s)

Steve Siegel (18)

Stephen Siegel, CIH, Laboratory Manager
or other approved signatory

THIS IS THE LAST PAGE OF THE REPORT.

APPENDIX C

CERTIFICATE OF ANALYSIS - LEAD

ACCUTEST LABORATORIES LTD.

Report of Analysis

Client: Aqua Terre Solutions Inc.

2 Gurdwara Rd., Suite 200
Nepean, ON
K2E 1A2

Report Number: 2719940
Date Reported: 2007-09-04
Date Submitted: 2007-08-31
Project: 07-120

Attention: Mr. Mark Foerster

P.O. Number: 270376
Matrix Paint Chips

METHOD: Analysis was performed on an Aqua-Regia digest of the sample material.

RESULTS:

LAB ID	Sample ID	Description	MRL	Lead (Pb) ug/g
568718	CBB1-Pb-1		3	45300
568719	CBB1-Pb-2		3	1310
568720	CBB1-Pb-3		5	2100
568721	CBB1-Pb-4		3	80
568722	CBB1-Pb-5		3	3560
568723	CBB1-Pb-6		5	220
568724	CBB1-Pb-7		3	2400
568725	CBB1-Pb-8		3	543
568726	CBB1-Pb-9		3	46
568727	CBB1-Pb-10		3	9
568728	CBB1-Pb-11		3	125
568729	CBB1-Pb-12		5	71
568730	CBB1-Pb-13		3	27
568731	CBB1-Pb-14		3	8

COMMENT:

MRL = Method Reporting Limit

Approval:
Ewan McRobbie
Inorganic Laboratory Supervisor