

21 March 2017

Amec Foster Wheeler Project Number: WX17835PRW

Public Works and Government Services Canada
5th Fl, 10025 Jasper Avenue,
Edmonton, Alberta

Copy sent by E-mail: Liana.Smith@pwgsc-tpsgc.gc.ca

Attn. Ms. Liana Smith

**Re: Final Closure Report
Hazardous Materials Consulting Services
Buildings 14, 10 and 26, Beaverlodge Research Centre
Beaverlodge, Alberta**

1.0 INTRODUCTION AND PROJECT BACKGROUND

Amec Foster Wheeler Environment & Infrastructure, a division of Amec Foster Wheeler Americas Ltd. (Amec Foster Wheeler), was retained by Public Works and Government Canada (PWGSC), to provide consulting services associated with the abatement of hazardous building materials previously identified within buildings 14, 10 and 26 at the Agriculture and Agri-Food Canada (AAFC) Beaverlodge Research Centre in Beaverlodge, Alberta (the 'Site').

The hazardous building materials were previously identified at the Site in the report prepared by Ballast Environmental Consulting entitled "Hazardous materials Investigation Lacombe, Beaverlodge and Fort Vermillion Research Centres", dated April 12, 2011 revised March 2013. Amec Foster Wheeler identified additional hazardous material at the Site which were included in the site specific specifications issued to PWGSC on 26 July 2016. The removal and disposal of the identified materials was to be conducted in accordance with these specified documents and the Alberta regulations and guidelines.

2.0 PROJECT SCOPE OF WORK

Amec Foster Wheeler's objective was to provide consulting services associated with hazardous material abatement of the Canola Laboratory #10, the Soils Research Building #14 and the Storage Building #26 at the Beaverlodge Research Centre in Beaverlodge, Alberta.

Removal and disposal of hazardous building materials from the facility was completed by EnviroVac, a division of Paragon Remediation Group Ltd. (Envirovac) who were retained by PWGSC. The schedule for the removal was developed and maintained by Envirovac based on agreements with PWGSC.

The original contractor scope of work for the removal of hazardous building materials consisted of the following materials which was listed in the project specifications.

Amec Foster Wheeler Environment & Infrastructure
440 Dovercourt Drive
Winnipeg, Manitoba
Canada R3Y 1N4
Tel +1 (204) 488-2997
Fax +1 (204) 489-8261

www.amecfw.com

Building # 14, Soils Research Centre		
Location	Material	Estimated Quantity
Southwest lab on the main floor	Vinyl floor tile (VFT) and mastic White/Grey (228mm X 228mm)	170 m ²
2 nd floor northeast office	VFT and mastic White/Grey (228mm X 228mm)	
Northwest lab and under the stair well on the main floor	VFT and mastic Light and dark brown 228mm X 228 mm)	55 m ²
First floor entry of building and 2 nd floor panel room	Grey VFT (non-ACM mastic) (304mm X 304mm)	20 m ²
Floor of power panel room	Grey VFT (non-ACM mastic) (228mm X 228mm)	8 m ²
Floor, walls and ceiling on the second floor	Cement board (Transite)	600 m ²
Main floor in the north east lab, hallway, growth chamber, entry, porch, stairs and washroom	Brown square pattern vinyl sheet (linoleum) flooring	84 m ²
Underside of sinks in the southwest and northeast labs on the first floor	Sink insulation, bronze and grey coloured	4 sinks
Southwest lab, northwest lab and furnace room.	Gypsum board and ACM joint compound	200 m ²
Located in remainder of building	Gypsum board and presumed ACM joint compound	885 m ²
Window trim throughout the building	Lead containing paint (LCP)	10 windows
Door frames on exterior doors	Presumed LCP	3 doors
Main floor southwest lab and second floor labs 1 and 2	Fluorescent lighting ballasts (suspected to contain Polychlorinated Biphenyls (PCBs)	8 ballasts
Main floor southwest lab and second floor labs 1 and 2	Mercury associated with fluorescent bulbs	8 fixtures
First floor hallway, growth chamber and lab 1.	Mercury thermostat	4 Thermostats
First floor growth chamber room, NW lab and lab 2.	Ozone depleting substances (ODS)	3 fridges and 1 growth chamber
Second floor in the hallway	Smoke detector	1 smoke detector

Building # 26, Storage Building		
Location	Material	Estimated Quantity
Northwest corner of the threshing room and northeast corner of the furnace room	Cement board (Transite)	11 m
Located in lab 1 and offices 2, 3 and 4	VFT (various size and colour)	90 m ²
Located in the attic and present as debris in the occupied space	Attic insulation (vermiculite)	540 m ² (within the attic)
Located in lab 2 and office 3	Cement board counter tops	14 m ²
South wall of threshing room and southwest area of women's washroom	SVG on pipe and walls	Not quantified
Located throughout the building (approximately 10 locations)	Gypsum board and joint compound	15 m ²

Building # 10, Canola Laboratory		
Location	Material	Estimated Quantity
Office 5	Brown VFT (non-ACM mastic) (304mm X 304mm)	20 m ²
Basement storage 6 and 7, two small rooms within basement storage 7 and hallway between storage 7 and 8.	Light and dark brown floor tile (non-ACM mastic) (228mm X 228mm)	45 m ²
Throughout building	Gypsum board and joint compound (joint compound confirmed ACM in select locations and presumed ACM in remainder of building)	2400 m ²
Basement coolers (storage 4 and 5)	Pipe insulation	8 liner meters
Various	Heat shield associated to incandescent lighting fixture	7 light fixtures
Basement coolers (storage 4 and 5)	Interior caulking around wiring	1m
Basement furnace room	Insulation on furnace	1.5 m ³
Storage 4 and 5	Interior caulking around incandescent light fixtures	4 fixtures
Basement storage rooms 1,2,3 and 9	LCP (interior white/yellow)	120 m ²
Door frames and window trim throughout the building	LCP (exterior white)	4 doors and 29 Windows
Southwest office and lunch room on the second floor	Fluorescent lighting ballasts (suspected to contain PCBs)	3 Ballasts
Located throughout the building	Mercury associated with fluorescent bulbs	3 Fixtures
First floor hallway	Mercury containing thermostat	1 thermostat
Office 2, main floor east hallway and main floor storage area	Ozone depleting substances (ODS)	2 refrigerators and 3 incubators
Various locations	Suspect visual mould growth (SVG)	Not quantified

During a site visits conducted by Amec Foster Wheeler prior to and during removal activities, additional suspect asbestos-containing materials (ACMs) were identified. The following materials were confirmed to be regulated ACMs through sampling and laboratory analysis.

- Vinyl asbestos floor tile (yellow and grey layers) in Bldg 10 rooms Lab NW, Lab W-N and main floor (remain on Site);
- Vermiculite in exterior overhang of Bldg 10, south exterior door (remains on Site);
- Mastic on floor, Bldg 14, main floor entry (remains on Site);
- Joint compound on plywood, Building 14 stairs/entry, SW Lab, second and main floor hallways, growth chambers and washroom (remains on Site); and
- Roof mastic, Bldg 14, located on rooftop anchors (remains on Site).

Vermiculite insulation was identified in the main floor west wall exterior of Bldg 14 (remains on Site). The vermiculite was not sampled and was presumed to contain asbestos based on discussions with PWGSC.

Mortar was identified on the boiler in Bldg 10 which was sampled and analyzed for asbestos content (remains on Site). The mortar contained <1% Chrysotile asbestos fibres and is not considered a regulated ACM due to the concentration reported and the non friable nature of the material. Contractors should be advised of the presence of this material prior to demolition.

3.0 SUMMARY OF REMOVAL ACTIVITIES

Hazardous materials abatement was conducted at the Site from 04 November 2016 to 14 December 2017 by Envirovac. Amec Foster Wheeler conducted daily inspections during abatement activities. The inspection reports are included in Appendix B.

Removal of ACMs was conducted in accordance with Low Risk, Moderate Risk and High Risk asbestos abatement procedures where applicable, as outlined by the Alberta Asbestos Abatement Manual and the project specifications. Amec Foster Wheeler observed the removal of the majority of the above listed ACMs.

PWGSC in consultation with AAFC and Amec Foster Wheeler determined that select hazardous materials would remain in place for future abatement. The decision to leave these materials in place was due to the limited AAFC budget and that some removal would have been destructive in nature, leaving the building exposed to the elements (snow, rain, etc.) In addition, the mastic located on the roof anchors of Building 14 was to remain in place with selective building demolition conducted to allow abatement of the mastic from demolition debris. The non-friable mortar located on the boiler in building 10 is not a regulated asbestos containing material but the presence of this material should be disclosed to the demolition contractor. ACM remaining on site are listed in section 4.0 of this report.

Envirovac collected five samples of lead containing paint from Buildings 10 and 14 for TCLP analysis. Based on the analytical results, it was determined that this painted materials could be disposed of to landfill as part of building demolition activities. These materials are listed in section 4.0 of this report.

Envirovac also conducted the removal of fluorescent light tubes, mercury containing thermostats, ozone depleting substances, mould impacted building materials and a smoke detector from Buildings 10 and 14.

3.1 Inspections and Air sampling

The above noted removal activities were documented in project communications including thirty-four field inspection reports. The field inspection reports documented the daily abatement activities, documented issues and how they were rectified and provided the results of the air sampling program.

Amec Foster Wheeler conducted air sampling throughout the abatement process. Area and personal air samples were obtained to monitor potential airborne fibre migration from and within the restricted areas. The air sampling program included a total of 78 samples. The sampling was conducted and analysed by Amec Foster Wheeler's on-site technician in general accordance with NIOSH Method 7400. Air sampling was completed using high and low volume constant flow sampling pumps and 25 mm cellulose ester membrane filters. The samples were analysed using Phase Contrast Microscopy (PCM) techniques.

Area air samples collected during asbestos abatement activities, in areas adjacent to containments, and in clean areas were generally below 0.01 fibres per cubic centimetre (f/cm³), less than the investigative criteria of 0.05 f/cm³ (50% of the Alberta Occupational Exposure Limit (OEL) of 0.1 f/cm³ for asbestos).. Similarly, air clearance samples collected within containments, following abatement activities, were all less than the air clearance criteria of <0.01 f/cm³. In combination with visual clearance, the air clearance samples were used to determine if the work areas met regulatory requirements for re-occupancy.

4.0 CONCLUSIONS

Based on Amec Foster Wheeler's observations, hazardous materials were removed from Buildings 10, 14 and 26 at the Beaverlodge Research Centre. Based on Amec Foster Wheeler's observations and testing, the work was completed in accordance to the project specification and/or PWGSC's instructions. Amec Foster Wheeler understands that the remaining hazardous materials in buildings 10 and 14 will be abated prior to demolition, with the roof anchor mastic in Building 14 removed concurrent to demolition activities. Hazardous materials remain in place in Building 26 and Amec Foster Wheeler understands that consideration is currently being given by AAFC to remove fluorescent lighting ballasts suspected to contain polychlorinated biphenyls. Amec Foster Wheeler further understands that AAFC is considering developing an asbestos management program for the ongoing management in place of remaining ACMs in Building 26, including residual vermiculite suspected to be present between structural components and in voids such as wall cavities. Hazardous materials remaining in Building 26 are summarized on a Drawing in Appendix C.

From the work practices and procedures observed and based on the site inspections and recorded airborne fibre concentrations, all indications are that the hazardous materials abatement work was conducted in a controlled manner, and in accordance with Alberta Labour Occupational Health and Safety requirements.

Hazardous materials waste was removed from the Site by Envirovac for disposal at appropriate facilities as specified. Copies of the complete asbestos waste disposal receipts were received in February 2017 and are included in Appendix A. Amec Foster Wheeler concludes that identified hazardous materials removed from the buildings have been properly removed from the Site.

Some hazardous materials remain at the Site which have been listed in the tables below.

Remaining Hazardous Materials Building # 14, Soils Research Centre				
Location	Material	Estimated Quantity	Notes	Rationale
Roof	Grey/Black mastic on roof anchors	0.1 m ²	Asbestos containing material	To be removed during selective demolition
Main floor Porch, Entry and Hall	Mastic on floor	33 m ²	Asbestos containing material. Partially removed in Hall	AAFC budgetary constraints
South exterior wall on main floor	Vermiculite and non-asbestos vapour barrier and insulation material	20 m ²	Asbestos containing material. Confirmed present in bottom half of wall but suspected to be present floor to ceiling. Identified in Dec 2016	AAFC budgetary constraints
Walls of main floor Growth Chamber, Hall, SW Lab, Entry, Washroom and Stairwell	Gypsum board joint compound on plywood wall covering	153 m ²	Asbestos containing material. Previously hidden material. Identified in Dec 2016	AAFC budgetary constraints
Walls of second floor Hall	Gypsum board joint compound on plywood wall covering	7 m ²	Asbestos containing material. Previously hidden material. Identified in Dec 2016	AAFC budgetary constraints
Second floor power panel room	Cementitious asbestos board (Transite) behind electrical panel	2 m ²	Asbestos containing material.	Must remain in place for continued electrical service to building until demolition
Door frames on exterior doors	Lead containing paint 0.33% lead by weight; <0.3 mg/L TCLP	3 doors	May be disposed to regular landfill	May be disposed to regular landfill as part of demolition

Remaining Hazardous Materials Building # 10, Canola Laboratory				
Location	Material	Estimated Quantity	Notes	Rationale
Exterior overhang – south entrance	Vermiculite	3.7 m ²	Asbestos containing material	AAFC budgetary constraints
Exterior overhang – south entrance	Pipe insulation on two pipes running through canopy	1 linear m	Asbestos containing material. Previously hidden material	AAFC budgetary constraints
Lab W-N	Layer 1 – Grey VFT contains 5% Chrysotile Layer 2 – Yellow VFT contains 5% Chrysotile Tar paper backing – no asbestos fibres detected	15 m ²	Asbestos containing material. Located under linoleum and OSB subflooring	AAFC budgetary constraints
Lab NW	Layer 1 – Grey VFT contains 5% Chrysotile Layer 2 – Yellow VFT contains 5% Chrysotile Tar paper backing – no asbestos fibres detected	49 m ²	Asbestos containing material. Located under linoleum and OSB subflooring	AAFC budgetary constraints
Basement furnace room	Non-Friable mortar on furnace - contains <1% Chrysotile	Not quantified	Not a regulated ACM.	May be disposed to regular landfill as part of demolition
Basement storage rooms 1,2,3 and 9	Lead containing paint (interior white/yellow) 0.66% lead by weight; <0.30 mg/L TCLP	120 m ²	May be disposed to regular landfill	May be disposed to regular landfill as part of demolition
Door frames and window trim throughout the building	Lead containing paint (exterior white) 4.7% lead by weight; 1.57 to 3.44 mg/L TCLP	4 doors and 29 Windows	May be disposed to regular landfill	May be disposed to regular landfill as part of demolition

Remaining Hazardous Materials Building # 26, Storage Building				
Location	Material	Estimated Quantity	Notes	Rationale
The vermiculite in the attic space was abated in November/December of 2016.	Vermiculite Insulation	Unknown	Asbestos containing material. Vermiculite may remain between structural components or hidden in voids including wall cavities	ACM to be managed in place
Located throughout the building (walls and ceilings)	Gypsum board and joint compound	Not quantified	Asbestos containing material	ACM to be managed in place
Located in the washrooms, hallway and office	VFT (various sizes and colours)	35 m ²	Asbestos containing material	ACM to be managed in place
Located in various areas	Fluorescent lighting ballasts (suspected to contain PCBs)	28 ballasts	-	Required for building operation
Cooler area	Mercury containing thermostat	1 thermostat	-	Required for building operation
Located throughout the building	Mercury associated with fluorescent bulbs	28 fixtures	-	Required for building operation
Walk in cooler	Presumed ODS	1 cooler	-	Required for building operation

5.0 CLOSURE

Amec Foster Wheeler has prepared this report for the express use of the Public Works and Government Services Canada and may be relied upon by Public Works and Government Services Canada. No other person or organization is entitled to rely upon any part of this report without the prior written consent of Amec Foster Wheeler. Public Works and Government Services Canada may release all or part(s) of this report to third parties; however, such third party in using this report agrees that it shall have no legal recourse against Amec Foster Wheeler or its subsidiaries, and shall indemnify and defend Amec Foster Wheeler or its subsidiaries from and against all claims arising out of or in conjunction with such use or reliance.

This report presents an overview of issues of concern with the specified substances, reflecting Amec Foster Wheeler's best judgment using information reasonably available at the time of Amec Foster Wheeler's evaluation / survey.

No other warranty, expressed or implied, is made. This Report is also subject to the contractual project agreement.

We trust this report meets your requirements. If you have any questions, please contact the undersigned.

Respectfully,
Amec Foster Wheeler Environment & Infrastructure



Paul Houle, CRSP, EP, P.Mgr., MBA
Senior Hazardous Materials Specialist
Health, Safety & Environment Services
Email: paul.houle@amecfw.com

Reviewed by:



Patrick Campbell, B.Sc., EP, CRSP
Associate Environmental Scientist
Manager - Health, Safety & Environment Services
Email: patrick.campbell@amecfw.com

APPENDIX A
WASTE DISPOSAL DOCUMENTATION

ENVIRO-VAC SHIPPING DOCUMENT

Consignor Name & Site Address:

Enviro Vac
 100038 Township Rd 720
 Beaverlodge AB
 T0H 0C6

Consignee (Destination) Name & Physical Address:

DATE:

Nov. 14/16

Shipping Document #

REGULATED DANGEROUS GOODS

24-HOUR NUMBER:

CANUTEC
24 Hour # (613) 996-6666
(Only if applicable)

ERAP reference #: N/A

ERAP telephone number: N/A

Asbestos waste does not require an ERAP

UN number	Shipping name (If applicable, Technical Name)	Primary Class	Subsidiary Class	Packing Group	Total Quantity (kg)	Number of packages requiring labels (e.g. # of bags/bins)
2590	Waste White Asbestos	9	N/A	III	Approx 8000	1 Bin

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the *Transportation of Dangerous Goods Regulations*.

Jason Herritt

 Shipper's name (please **print**) on behalf of Cosignor

No signature required

ENVIRO-VAC SHIPPING DOCUMENT

Consignor Name & Site Address:

Enviro Vac
 100038 Township Rd. 720
 Beaverledge, AB TO HOCO

Consignee (Destination) Name & Physical Address:

DATE:

Nov. 22/16

Shipping Document #

REGULATED DANGEROUS GOODS

24-HOUR NUMBER:

CANUTEC
24 Hour # (613) 996-6666
(Only if applicable)

ERAP reference #: N/A

ERAP telephone number: N/A

Asbestos waste does not require an ERAP

UN number	Shipping name (If applicable, Technical Name)	Primary Class	Subsidiary Class	Packing Group	Total Quantity (kg)	Number of packages requiring labels (e.g. # of bags/bins)
2590	Waste White Asbestos	9	N/A	III	Approx. 8000	① Bin

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the *Transportation of Dangerous Goods Regulations*.

Jason Herritt

 Shipper's name (please **print**) on behalf of Cosignor

No signature required

ENVIRO-VAC SHIPPING DOCUMENT

Consignor Name & Site Address:

Enviro Vac
 100038 Township Rd.
 Beaverlodge, AB
 T0H 0C0

Consignee (Destination) Name & Physical Address:

DATE:

Nov. 30/16

Shipping Document #

REGULATED DANGEROUS GOODS

24-HOUR NUMBER:

CANUTEC
24 Hour # (613) 996-6666
(Only if applicable)

ERAP reference #: N/A

ERAP telephone number: N/A

Asbestos waste does not require an ERAP

UN number	Shipping name (If applicable, Technical Name)	Primary Class	Subsidiary Class	Packing Group	Total Quantity (kg)	Number of packages requiring labels (e.g. # of bags/bins)
2590	Waste White Asbestos	9	N/A	III	Approx 8000kg	① Bin

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the *Transportation of Dangerous Goods Regulations*.

Jason Herritt

 Shipper's name (please **print**) on behalf of Cosignor

No signature required

ENVIRO-VAC SHIPPING DOCUMENT

Consignor Name & Site Address:

Enviro Vac
 100038 Township Rd. 720
 Beaver Lodge, AB T0H 0C0

Consignee (Destination) Name & Physical Address:

DATE:

Dec. 06/16

Shipping Document #

REGULATED DANGEROUS GOODS

24-HOUR NUMBER:

CANUTEC
24 Hour # (613) 996-6666
(Only if applicable)

ERAP reference #: N/A

ERAP telephone number: N/A

Asbestos waste does not require an ERAP

UN number	Shipping name (If applicable, Technical Name)	Primary Class	Subsidiary Class	Packing Group	Total Quantity (kg)	Number of packages requiring labels (e.g. # of bags/bins)
2590	Waste White Asbestos	9	N/A	III	Approx. 8000	① Bin

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the *Transportation of Dangerous Goods Regulations*.

Jason Hemm

Shipper's name (please **print**) on behalf of Cosignor

No signature required

ENVIRO-VAC SHIPPING DOCUMENT

Consignor Name & Site Address:

Enviro Vac
 100038 Township Rd 720
 Beaverlodge, AB
 T0H 0C0

Consignee (Destination) Name & Physical Address:

DATE:

Dec. 14/16

Shipping Document #

REGULATED DANGEROUS GOODS

24-HOUR NUMBER:

CANUTEC
24 Hour # (613) 996-6666
(Only if applicable)

ERAP reference #: N/A

ERAP telephone number: N/A

Asbestos waste does not require an ERAP

UN number	Shipping name (If applicable, Technical Name)	Primary Class	Subsidiary Class	Packing Group	Total Quantity (kg)	Number of packages requiring labels (e.g. # of bags/bins)
2590	Waste White Asbestos	9	N/A	III	Approx. 8000	① Bin
2590	Waste White Asbestos	9	N/A	III	Approx. 8000	① Bin

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the *Transportation of Dangerous Goods Regulations*.



Shipper's name (please **print**) on behalf of Cosignor

No signature required

Aquatera Waste Management Facility Class II
4506 100 St.
Grande Prairie, AB
(780)-538-0452

ACCOUNT #:0024468
COMPANY:GFL Environmental Inc
8409-15 St
Edmonton AB T6P 0B8

TICKET #:4002814
DATE:11/30/16
TIME:13:02
OPERATOR ID:PAR

TAG:GFL4709 VEHICLE:Tandem Rolloff ORIGIN:Commercial
TRANSACTION:Inbound VEHICLE DESCRIPTION:4709 DESTINATION:Cell 6

TODAY'S TRANSACTION COUNT:9.33 Tons - 5 Loads

MATERIAL:51 - Asbestos 4.70TNS @ \$235.00/TN
MATERIAL: TNS @

TIPPING FEE:1004.10
SPEC FEE:
SF RATE: 0.00

	KGS	TNS
GROSS	23520	23.52
TARE	18820	18.82
NET	4700	4.70

PAYMENT INFO: Tend Coup #
1 - Account 1104.50

TOTAL TENDERED: 1104.50
GRAND TOTAL:\$1104.50
CHANGE: 0.00

TIPPING FEE: 1004.10
M.F. Fee (10%): 100.41
GRAND TOTAL:\$1104.50

SIGNATURE: 

NOTE:

Aquatera Waste Management Facility Class II
4506 100 St.
Grande Prairie, AB
(780)-538-0452

ACCOUNT #:0024468
COMPANY:GFL Environmental Inc
8409-15 St
Edmonton AB T6P 0B8

TICKET #:4003371
DATE:12/07/16
TIME:10:58
OPERATOR ID:KAP

TAG:GFL4622 VEHICLE:Tandem Rolloff ORIGIN:Commercial
TRANSACTION:Inbound VEHICLE DESCRIPTION:jason DESTINATION:Cell 6

TODAY'S TRANSACTION COUNT:2.20 Tons - 1 Loads

MATERIAL:51 - Asbestos 2.20TNS @ \$235.00/TN
MATERIAL: TNS @

TIPPING FEE: 470.00
SPEC FEE:
SF RATE: 0.00

	KGS	TNS
GROSS	17070	17.07
TARE	14870	14.87
NET	2200	2.20

PAYMENT INFO: Tend Coup #
1 - Account \$517.00

TOTAL TENDERED: 517.00
GRAND TOTAL: \$517.00
CHANGE: 0.00

TIPPING FEE: 470.00
M.F. Fee (10%): 47.00
GRAND TOTAL: \$517.00

SIGNATURE:

NOTE:

Aquatera Waste Management Facility Class II
4506 100 St.
Grande Prairie, AB
(780)-538-0452

ACCOUNT #:0024468
COMPANY:GFL Environmental Inc
8409-15 St
Edmonton AB T6P 0B8

TICKET #:4003848
DATE:12/14/16
TIME:11:05
OPERATOR ID:KAP

TAG:GFL4626 VEHICLE:Tandem Rolloff ORIGIN:Commercial
TRANSACTION:Inbound VEHICLE DESCRIPTION:ED DESTINATION:Cell 6

TODAY'S TRANSACTION COUNT:1.85 Tons - 1 Loads

MATERIAL:51 - Asbestos 1.85TNS @ \$235.00/TN
MATERIAL: TNS @

TIPPING FEE: 395.20
SPEC FEE:
SF RATE: 0.00

	KGS	TNS
GROSS	17310	17.31
TARE	15460	15.46
NET	1850	1.85

PAYMENT INFO: Tend Coup #
1 - Account \$434.70

TOTAL TENDERED: 434.70
GRAND TOTAL: \$434.70
CHANGE: 0.00

TIPPING FEE: 395.20
M.F. Fee (10%): 39.52
GRAND TOTAL: \$434.70

SIGNATURE: Ed ELDRIDGE EJ Eldridge

NOTE:

Aquatera Waste Management Facility Class II
4506 100 St.
Grande Prairie, AB
(780)-538-0452

ACCOUNT #:0024468
COMPANY:GFL Environmental Inc
8409-15 St
Edmonton AB T6P 0B8

TICKET #:4003856
DATE:12/14/16
TIME:11:31
OPERATOR ID:KAP

TAG:GFL4622 VEHICLE:Tandem Rolloff ORIGIN:Commercial
TRANSACTION:Inbound VEHICLE DESCRIPTION:GFL4622 DESTINATION:Cell 6

TODAY'S TRANSACTION COUNT:14.66 Tons - 4 Loads

MATERIAL:51 - Asbestos 5.17TNS @ \$235.00/TN
MATERIAL: TNS @

TIPPING FEE:1104.50
SPEC FEE:
SF RATE: 0.00

	KGS	TNS
GROSS	19830	19.83
TARE	14660	14.66
NET	5170	5.17

PAYMENT INFO: Tend Coup #
1 - Account 1215.00

TOTAL TENDERED: 1215.00
GRAND TOTAL:\$1215.00
CHANGE: 0.00

TIPPING FEE: 1104.50
M.F. Fee (10%): 110.45
GRAND TOTAL:\$1215.00

SIGNATURE:

NOTE:

Aquatera Waste Management Facility Class II
4506 100 St.
Grande Prairie, AB
(780)-538-0452

ACCOUNT #:0024468

COMPANY:GFL Environmental Inc

8409-15 St

Edmonton

AB

T6P 0B8

TICKET #:4004359

DATE:12/20/16

TIME:10:19

OPERATOR ID:KAP

TAG:GFL4626

VEHICLE:Tandem Rolloff

ORIGIN:Commercial

TRANSACTION:Inbound

VEHICLE DESCRIPTION:ED

DESTINATION:Cell 6

TODAY'S TRANSACTION COUNT:3.25 Tons - 2 Loads

MATERIAL:51 - Asbestos

.38TNS @ \$235.00/TN

MATERIAL:

TNS @

TIPPING FEE: 81.20

SPEC FEE:

SF RATE: 0.00

	KGS	TNS
GROSS	16630	16.63
TARE	16250	16.25
NET	380	0.38

PAYMENT INFO:

Tend

Coup #

1 - Account

\$89.30

TOTAL TENDERED: 89.30

GRAND TOTAL: \$89.30

CHANGE: 0.00

TIPPING FEE: 81.20

M.F. Fee (10%): 8.12

GRAND TOTAL: \$89.30

SIGNATURE:

ED ELDRIDGE

ET Eldridge

NOTE:

7722 9 Street NW, Edmonton, AB T6P 1L6
780-440-1825 ❖ 1-800-661-5792 ❖ Fax 780-440-2428
24 Hour Emergency Response 1-866-856-5366
www.aevitas.ca



❑ BILL OF LADING
☑ RECYCLE DOCKET
ORIGINAL - NOT-NEGOTIABLE
E 4423

CARRIER: AEVITAS INC.

7722 9 Street NW Edmonton, AB T6P 1L6

Vehicle: 207 207

Driver Name: Tony Melles

Driver Signature: [Signature]

Carrier - Other: ☐

Work Order #: 55964

Date: Dec 8/16

PO #:

Manifest #:

Charges:

Generator/Consignor: same as carrier ☐

Receiver/Consignee: same as carrier ☒

Placard Required: Yes: ☐ No: ☒

Company: Bauerlodge Research Toxic

Company:

Address: 100038 - Twp 720

Address:

Name: Bauerlodge A.B. TCH OCO

Name: [Signature]

Name:

Signature: [Signature]

Signature:

Physical State	DG	TDGA/ UN #	Proper Shipping Name
----------------	----	------------	----------------------

Class

PG

Packaging

Quantity

Unit

Good Order

Discrepancy

Received - Initialed

S	4	2803	Mercury	8 (6.1)	II	1	07	EST	1	kg		
---	---	------	---------	---------	----	---	----	-----	---	----	--	--

S		N/A	N/A - Regulated Solids (Smoke Detector)	N/A	N/A	1	07	EST	1	kg		
---	--	-----	---	-----	-----	---	----	-----	---	----	--	--

S		2867	Refrigerating Machine containing 4 ft	2.2	II	1	07	EST	60	kg		
---	--	------	---------------------------------------	-----	----	---	----	-----	----	----	--	--

S		N/A	Fluorescent Tubes 4 ft	N/A	N/A	1	01	EST	20	kg		
---	--	-----	------------------------	-----	-----	---	----	-----	----	----	--	--

S		N/A	Fluorescent Tubes 8 ft	N/A	N/A	1	07	EST	30	kg		
---	--	-----	------------------------	-----	-----	---	----	-----	----	----	--	--

I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, are properly classified and packaged, have dangerous goods safety marks properly affixed or displayed on them, and are in all respects in proper condition for transport according to the Transportation of Dangerous Goods Regulations.

Name: [Signature]
Signature: [Signature]

= Total Weight

Arrival Time: 8:30 Am

Departure Time: 11:30 Am

Workers: 1

Total Site Time: 3 hrs

Supplies Used or Left on Site:

Drums:

Pails: 4 x 20L

Drums:

Other:

(Cardboard) 1

Consignee Certification:

Name:

Signature:

Date:

It is mutually agreed as to each carrier of all or any part of, said property over all or any said portion of said route to destination and as to each party, at any time interested in all or any said property, that every service performed hereunder shall be subject to all bill of lading terms and conditions in the governing classification on the date of shipment.

WASTE MANIFEST ATTACHMENT SHEET

Waste Shipped From: 100038 - TWP 720 Beaver Lodge

To: 7722 955 Chambers A-B

[illegible]

Dec 08/16

Dec 8/16

Any Discrepancies: Yes _____ No _____ (If yes, attach details)

Certificate of Disposal

ISSUED BY: AEVITAS INC
7722 9 Street
Edmonton, AB T6P 1L6
PHONE: (780) 440-1825
FAX: (780) 440-2428

RECEIVER # ABR-1062
JOB: 20162335-1
RECYCLE DOCKET: E4423
DATE RECEIVED: December 8, 2016

ISSUED TO: Paragon Business Services
8815 Harvie Road
Surrey BC V4N 4B9

GENERATOR: Beaverlodge Research Farm
100038 TWP 720
Beaverlodge AB T0H 0C0



These materials have been processed to the extent outlined within Alberta Environmental Protection and Enhancement Act Approval 134-04-01 issued to Aevitas Inc.

Residuals from the processing have been bulked or blended with other like waste materials and are destined for final disposal or recycling; or the materials have been shipped to Approved final management facilities as waste materials generated by Aevitas Inc.

DISPOSAL METHOD:

Chemical Treatment
Disposal PCB
Recycling - Hazardous
Recycling - Fluorescent Tubes

Ludwig Eben
Facility Manager

DATE

THIS MUST BE POSTED ON THE STORAGE CONTAINER FOR THE REFRIGERANT AT ALL TIMES.
 The emptied system to be labelled as EMPTY once the refrigerant has been removed.

Dismantling, Decommissioning, or Destruction Notice for a Halocarbon (Refrigerant) System

Owner Name **Agriculture and agri-Food Canada (AAFC) C/O Public Works and Government Services Canada (PWGSC)**

Mailing Address City Province Postal Code

11 Laurier St, Phase III, Place du Portage Gatineau Quebec K1A 0S5

Specific Location of System

City Province Postal Code

Beaverlodge Alberta

Description of System *1 Window Mount A/C Unit (Kenmore) shipped intact, will be processed at Acvitas waste facility following all applicable regulations*

Name of Person that Recovered the Halocarbons

Type and Quantity of Halocarbons (Refrigerant) Recovered

Type	Quantity	Type of System	Final Destination


Envirowac - Jason Bennett
Acvitas - John Miller

PRINT YOUR NAME

SIGN HERE

APPENDIX B
INSPECTION REPORTS

HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	1
		Date	Friday, 4 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site/ Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26)/ Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Southwest Lab – Vinyl floor tile and mastic removal (Sample 14-01)		
	2. Building 14: Office 3 – Cement board removal (Sample 14-02)		
	3. Building 10: Office 9 – Gypsum board and joint compound removal (Sample 10-01)		
	4. Building 10: Storage Room 4 – Pipe insulation removal (Sample 10-02)		
	5. Building 10: Southwest Lab – Gypsum board and joint compound removal (Sample 10-03)		
	6. Building 26: Lab 1 (Sample 26-01)		
	7. Building 26: Seed Storage (Sample 26-02)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Buildings 26 and 10	Low	Enviro-Vac was performing setup and preparation activities throughout the day. No abatement of asbestos-containing materials took place on this day. Contractor provided after-hours access to Amec Foster Wheeler in order to collect clearance samples setup earlier this day.
Building 14	Low	Enviro-Vac was preparing the containment for moderate risk asbestos abatement.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Low	Two background air samples were setup and ran for approximately two hours. These samples were collected for the purpose of obtaining baseline airborne fibre levels within the building before the commencement of asbestos abatement activities.
Building 14	Low	Amec Foster Wheeler conducted a pre-contamination inspection and air sampling. Two clearance air samples were setup and ran for approximately 7.5 hours. These samples were collected for the purpose of evaluating two work areas where abatement had been performed without air monitoring.
Building 10	Low	Amec Foster Wheeler conducted a general inspection and air sampling. Three air clearance samples were setup and ran for approximately 7.5 hours. These samples were collected for the purpose of evaluating three work areas where abatement had been performed without air monitoring.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1	During the pre-contamination inspection for asbestos abatement in the Building 14, Amec Foster Wheeler determined that the wash bucket setup in the decontamination facility was not sufficient for moderate-risk asbestos abatement. A two-stage decontamination unit is required to allow the asbestos worker properly decontaminate themselves before leaving the asbestos work area. Amec Foster Wheeler will discuss the requirements with Enviro-Vac.
2	Amec Foster Wheeler discussed the activities to be performed the following day (5 November 2016). Moderate-risk asbestos abatement work to be conducted within Building 14 was discussed in detail and Amec Foster Wheeler instructed Enviro-Vac to assemble a two-stage decontamination unit for the activities prior to beginning any abatement work.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-01	Air Clearance: Southwest Lab	Building 14	3549	<0.01	Result below the project requirement. ^{1, 2, 3}
14-02	Air Clearance: Office 3		2847	<0.01	Result below the project requirement. ^{1, 2, 3}
10-01	Air Clearance: Office 9	Building 10	2587	<0.01	Result below the project requirement. ^{1, 2, 3}

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-02	Air Clearance: Storage Room 4		3471	<0.01	Result below the project requirement. ^{1, 2, 3}
10-03	Air Clearance: Southwest Lab		3503	<0.01	Result below the project requirement. ^{1, 2, 3}
26-01	Background: Lab 1	Building 26	472	<0.01	Result below the project requirement. ^{1, 2, 3}
26-02	Background: Seed Storage		451	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than.


¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – UNDERLOADED – MAY HAVE POSITIVE BIAS.

³ Non-fibrous Particulate – LOW.

Amec Foster Wheeler is a participant in the Canadian Association for Laboratory Accreditation (CALA) Inc. Proficiency Testing Program for Environmental Laboratories. Analytical methods used by Amec Foster Wheeler and their associate laboratories are those recommended by NIOSH or prescribed by the Alberta Provincial Government. Sample collection and analysis was completed in accordance with NIOSH 7400 Analytical Method (A Counting Rules).

HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	2
		Date	Saturday, 5 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Clean Room (within Lab 1) – Cement board, vinyl floor tile, mastic and drywall joint compound removal (Sample 14-03)		
	2. Building 14: Adjacent to Clean Room (within Lab 1) – Cement board, vinyl floor tile mastic removal and drywall joint compound removal (Sample 14-04)		
	3. Building 14: Porch (Outside Work Area) – Cement board, vinyl floor tile, mastic and drywall joint compound removal (Sample 14-05)		
	4. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile, mastic and drywall joint compound removal (Sample 14-06)		
	5. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile, mastic and drywall joint compound removal (Sample 14-07)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	Moderate	<p>Upon passing the pre-contamination inspection for the moderate-risk abatement activities, Enviro-Vac began removal of cement board from the walls and ceilings of the second floor and removal of flooring mastic from the first floor.</p> <p>Hand-powered tools were utilized for the abatement activities. Powered-air purifying respirators were utilized for respiratory protective equipment (RPE).</p> <p>Amec Foster Wheeler observed good housekeeping practices by Enviro-Vac, including the prompt cleanup and bagging of waste as it was produced.</p>

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		Air movement through the work area was observed to be excellent, with allowing for the efficient removal of dust as the abatement proceeded. Enviro-Vac conducted work from approximately 07:30 to 17:30.
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	Building 14 – Amec Foster Wheeler performed a pre-contamination inspection for the moderate-risk asbestos abatement activities to be conducted within the building. These consisted of the removal of cement board, vinyl floor tile and mastic. Enviro-Vac assembled a two-stage decontamination unit within Lab 1 of the second floor, sealing up all entryways and physical breaches leading to the adjacent room, Lab 2. The building work area consisted of all rooms, excluding Lab 1 and Power Panel room on the second floor, and the Porch on the first floor. The inspection was passed and Amec Foster Wheeler setup ambient air samples in the clean room of the decontamination unit, adjacent to the clean room and in the Porch area. Occupational samples were collected from two workers, one performing cement board removal and another performing cleanup and housekeeping duties. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1	Building 14 – Amec Foster Wheeler instructed Enviro-Vac to re-seal a breach that had formed in the door leading from the Porch, outside the work area, to the Entry area inside the work area. The breach was repaired promptly.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-03	Ambient: Clean Room (within Lab 1)	Building 14	1357	<0.01	Result below the project requirement. ^{1, 2, 3}
14-04	Ambient: Adjacent to Clean Room (within Lab 1)	Building 14	1342	<0.01	Result below the project requirement. ^{1, 2, 3}
14-05	Ambient: Porch (Outside Work Area)	Building 14	1362	<0.01	Result below the project requirement. ^{1, 2, 3}
14-06	Occupational on Worker: Cement Board Removal	Building 14	65	0.1	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-07	Occupational on Worker: Cleaning and Housekeeping	Building 14	64	0.1	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – UNDERLOADED – MAY HAVE POSITIVE BIAS.


³ Non-fibrous Particulate – LOW.

⁴ The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	3
		Date	Monday, 7 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Clean Room (within Lab 1) – Cement board, vinyl floor tile and mastic removal (Sample 14-08)		
	2. Building 14: Adjacent to Clean Room (within Lab 1) – Cement board, vinyl floor tile and mastic removal (Sample 14-09)		
	3. Building 14: Porch (Outside Work Area) – Cement board, vinyl floor tile and mastic removal (Sample 14-10)		
	4. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile and mastic removal (Sample 14-11)		
	5. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile and mastic removal (Sample 14-12)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	Moderate	<p>Abatement work continued on both floors.</p> <p>At 08:00, a final inspection of the asbestos-containing floor mastic removal within the NW Lab was requested.</p> <p>At 10:00, a final inspection of the cement board, floor tile and mastic removal within Office 2 was requested.</p> <p>Upon passing the inspections, the areas were glue-fogged and all access to the areas and breaches were sealed.</p> <p>Clearance air samples are to be collected following completion of the rest of the moderate-risk abatement work within the work area.</p> <p>Removal of cement board from the walls and ceilings of the second floor continued, and removal of the cement board, mastic and vinyl floor tiles began.</p>

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		<p>On the first floor, drywall board and joint compound and vinyl floor tile removal began in the Furnace Room.</p> <p>Hand-powered tools were utilized for the abatement activities.</p> <p>Powered-air purifying respirators were utilized for respiratory protective equipment (RPE).</p> <p>Amec Foster Wheeler observed good housekeeping practices by Enviro-Vac, including the prompt cleanup and bagging of waste as it was produced.</p> <p>Air movement through the work area was observed to be excellent, with allowing for the efficient removal of dust as the abatement proceeded.</p> <p>Enviro-Vac conducted work from approximately 07:30 to 17:30.</p>
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	<p>Amec Foster Wheeler performed final inspections within the NW Lab and Office 2 and observed minor deficiencies with regards to asbestos-containing materials remaining in the work area.</p> <p>The deficiencies were promptly corrected and both inspections were passed.</p> <p>Occupational samples were collected from two workers, one performing cement board removal as well as bagging of waste on the second floor, and another performing drywall and vinyl floor tile removal within the first floor Furnace Room.</p> <p>Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30</p>
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1	During the final inspections of the NW Lab and Office 2, minor debris was observed. Amec Foster Wheeler instructed Enviro-Vac to remove the material, which was promptly completed while the inspections were being conducted.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-08	Ambient: Clean Room (within Lab 1)	Building 14	1347	<0.01	Result below the project requirement. ^{1, 2, 3}
14-04	Ambient: Adjacent to Clean Room (within Lab 1)		1448	<0.01	Result below the project requirement. ^{1, 2, 3}
14-05	Ambient: Porch (Outside Work Area)		1455	<0.01	Result below the project requirement. ^{1, 2, 3}
14-06	Occupational on Worker: Cement Board Removal		67	0.29	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-07	Occupational on Worker: Cleaning and Housekeeping		67	0.14	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	3
		Date	Monday, 7 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Clean Room (within Lab 1) – Cement board, vinyl floor tile and mastic removal (Sample 14-08)		
	2. Building 14: Adjacent to Clean Room (within Lab 1) – Cement board, vinyl floor tile and mastic removal (Sample 14-09)		
	3. Building 14: Porch (Outside Work Area) – Cement board, vinyl floor tile and mastic removal (Sample 14-10)		
	4. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile and mastic removal (Sample 14-11)		
	5. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile and mastic removal (Sample 14-12)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	Moderate	<p>Abatement work continued on both floors.</p> <p>At 08:00, a final inspection of the asbestos-containing floor mastic removal within the NW Lab was requested.</p> <p>At 10:00, a final inspection of the cement board, floor tile and mastic removal within Office 2 was requested.</p> <p>Upon passing the inspections, the areas were glue-fogged and all access to the areas and breaches were sealed.</p> <p>Clearance air samples are to be collected following completion of the rest of the moderate-risk abatement work within the work area.</p> <p>Removal of cement board from the walls and ceilings of the second floor continued, and removal of the cement board, mastic and vinyl floor tiles began.</p>

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		<p>On the first floor, drywall board and joint compound and vinyl floor tile removal began in the Furnace Room.</p> <p>Hand-powered tools were utilized for the abatement activities.</p> <p>Powered-air purifying respirators were utilized for respiratory protective equipment (RPE).</p> <p>Amec Foster Wheeler observed good housekeeping practices by Enviro-Vac, including the prompt cleanup and bagging of waste as it was produced.</p> <p>Air movement through the work area was observed to be excellent, with allowing for the efficient removal of dust as the abatement proceeded.</p> <p>Enviro-Vac conducted work from approximately 07:30 to 17:30.</p>
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	<p>Amec Foster Wheeler performed final inspections within the NW Lab and Office 2 and observed minor deficiencies with regards to asbestos-containing materials remaining in the work area.</p> <p>The deficiencies were promptly corrected and both inspections were passed.</p> <p>Occupational samples were collected from two workers, one performing cement board removal as well as bagging of waste on the second floor, and another performing drywall and vinyl floor tile removal within the first floor Furnace Room.</p> <p>Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30</p>
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1	During the final inspections of the NW Lab and Office 2, minor debris was observed. Amec Foster Wheeler instructed Enviro-Vac to remove the material, which was promptly completed while the inspections were being conducted.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-08	Ambient: Clean Room (within Lab 1)	Building 14	1347	<0.01	Result below the project requirement. ^{1, 2, 3}
14-09	Ambient: Adjacent to Clean Room (within Lab 1)		1448	<0.01	Result below the project requirement. ^{1, 2, 3}
14-10	Ambient: Porch (Outside Work Area)		1455	<0.01	Result below the project requirement. ^{1, 2, 3}
14-11	Occupational on Worker: Cement Board Removal		67	0.29	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-12	Occupational on Worker: Cleaning and Housekeeping		67	0.14	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	4
		Date	Tuesday, 8 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Clean Room (within Lab 1) – Cement board, vinyl floor tile and mastic removal (Sample 14-13)		
	2. Building 14: Adjacent to Clean Room (within Lab 1) – Cement board, vinyl floor tile and mastic removal (Sample 14-14)		
	3. Building 14: Porch (Outside Work Area) – Cement board, vinyl floor tile and mastic removal (Sample 14-15)		
	4. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile and mastic removal (Sample 14-16)		
	5. Building 14: Occupational Sample on Worker – Cement board, vinyl floor tile and mastic removal (Sample 14-17)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	Moderate	<p>Abatement work continued on both floors and was completed at approximately 14:00.</p> <p>A final inspection of Lab 2, Office 1, Porch and Furnace Room was requested and upon passing, Enviro-Vac applied lockdown glue to the second floor areas.</p> <p>Lockdown glue was not applied to the first floor which was isolated in preparation for high-risk abatement at a later date.</p> <p>Hand-powered tools were utilized for the abatement activities.</p> <p>Powered-air purifying respirators were utilized for respiratory protective equipment (RPE).</p>



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		Amec Foster Wheeler observed good housekeeping practices by Enviro-Vac, including the prompt cleanup and bagging of waste as it was produced. Enviro-Vac conducted work from approximately 07:30 to 17:30.
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	Amec Foster Wheeler performed a final inspection for the above listed areas. No deficiencies were observed and the inspection was passed. Occupational samples were collected from two workers, both performing vacuuming on the second floor prior to the final inspection. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30
Buildings 10 and 26	N.A.	No work was completed in Buildings 10 and 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No field instructions were issued to Enviro-Vac this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-13	Ambient: Clean Room (within Lab 1)	Building 14	1298	<0.01	Result below the project requirement. ^{1, 2, 3}
14-14	Ambient: Adjacent to Clean Room (within Lab 1)		1289	<0.01	Result below the project requirement. ^{1, 2, 3}
14-15	Ambient: Porch (Outside Work Area)		1300	<0.01	Result below the project requirement. ^{1, 2, 3}
14-16	Occupational on Worker: Vacuuming on Second Floor		110	0.02	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-17	Occupational on Worker: Vacuuming on Second Floor		111	<0.01	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

Amec Foster Wheeler is a participant in the Canadian Association for Laboratory Accreditation (CALA) Inc. Proficiency Testing Program for Environmental Laboratories. Analytical methods used by Amec Foster Wheeler and their associate laboratories are those recommended by NIOSH or prescribed by the Alberta Provincial Government. Sample collection and analysis was completed in accordance with NIOSH 7400 Analytical Method (A Counting Rules).

HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	5
		Date	Wednesday, 9 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Air Clearance in Lab 2 – Cement board, vinyl floor tile and mastic removal (Sample 14-18)		
	2. Building 14: Air Clearance in Office 4 – Cement board, vinyl floor tile and mastic removal (Sample 14-19)		
	3. Building 10: Clean Room (Top of Second Floor Stairwell) – Drywall Joint Compound (Sample 10-04)		
	4. Building 10: Adjacent Clean Room (Stairwell Landing) – Drywall Joint Compound (Sample 10-05)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	N.A.	Upon passing the air clearance sampling, Enviro-Vac entered the building to perform clean demolition activities on the second floor.
Building 10	Moderate	Enviro-Vac completed setup for moderate-risk abatement of drywall board and joint compound on the second floor of the building. This included assembly of a two-stage decontamination unit and sealing of window breaches and floor breaches. Two full-size negative air units were utilized for the moderate-risk setup. Upon passing the pre-contamination inspection, Enviro-Vac began the removal activities, which continued for the remainder of the work day. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 26	N.A.	No work was completed in Building 26.

Notes: N.A. = Not applicable.



Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	Amec Foster Wheeler collected and analyzed air clearance samples on the second floor, within Lab 2 and Office 4. Analysis determined that the samples were below 0.01 f/cc of asbestos and Enviro-Vac was given permission to enter the work area without asbestos personal protective equipment (PPE). Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30
Building 10	Moderate	Amec Foster Wheeler setup ambient air monitoring samples in support of the moderate-risk drywall and joint compound abatement activities on the second floor and performed a general inspection of the work area. Amec Foster Wheeler observed good housekeeping practices by Enviro-Vac, including the prompt cleanup and bagging of waste as it was produced.
Building 26	N.A.	No work was completed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No field instructions were issued to Enviro-Vac this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-18	Ambient: Air Clearance in Lab 2	Building 14	3906	<0.01	Result below the project requirement. ^{1, 2, 3}
14-19	Ambient: Air Clearance in Office 4		3940	<0.01	Result below the project requirement. ^{1, 2, 3}
10-04	Ambient: Clean Room (Top of Second Floor Stairwell)	Building 10	496	<0.01	Result below the project requirement. ^{1, 2, 3}
10-05	Ambient: Adjacent Clean Room (Stairwell Landing)		482	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.


² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	6
		Date	Thursday, 10 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Top of Second Floor Stairwell) – Drywall Joint Compound (Sample 10-06)		
	2. Building 10: Adjacent Clean Room (Stairwell Landing) – Drywall Joint Compound (Sample 10-07)		
	3. Building 10: Lab NE (First Floor) – Drywall Joint Compound (Sample 10-08)		
	4. Building 10: Occupational Sample (Drywall Removal) – Drywall Joint Compound (Sample 10-09)		
	5. Building 14: Clean Room (within Lab 2) – Cement Board, Vinyl Floor Tile and Mastic (Sample 14-20)		
	6. Building 14: Adjacent to Clean Room (within Lab 2) – Cement Board, Vinyl Floor Tile and Mastic (Sample 14-21)		
	7. Building 14: First Floor Entry – Cement Board, Vinyl Floor Tile and Mastic (Sample 14-22)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	Moderate	Enviro-Vac completed setup for moderate-risk abatement of cement board, vinyl floor tile and mastic within Lab 1 and Power Panel room on the north side of the building. This included assembly of a two-stage decontamination unit and sealing of all window breaches and floor breaches. A full-size negative air unit was utilized for the moderate-risk setup. Upon passing the pre-contamination inspection, Enviro-Vac began the removal activities, which continued for the remainder of the work day.



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Enviro-Vac continued the moderate-risk abatement of drywall board and joint compound on the second floor of the building. The abatement continued for the remainder of the work day. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 26	N.A.	No work was completed in Building 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	Amec Foster Wheeler completed a pre-contamination inspection of the Lab 1 and Power Panel room work area. Instructions were issued, Enviro-Vac corrected the sited issues and the inspection was passed. Amec Foster Wheeler collected ambient air monitoring samples in support of the abatement activities.
Building 10	Moderate	Amec Foster Wheeler completed an inspection of the second floor work area and worker activities. Instructions were issued and Enviro-Vac complied with them and improved the housekeeping activities within the work area. An occupational sample from a worker performing drywall removal was collected. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 26	N.A.	No work was completed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1.	Amec Foster Wheeler observed a buildup of drywall and joint compound debris present in the work area and instructed Enviro-Vac to perform debris cleanup more often to improve housekeeping within the work area. Enviro-Vac complied with the instructions.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-06	Ambient: Clean Room (Top of Second Floor Stairwell)	Building 10	1336	<0.01	Result below the project requirement. ^{1, 2, 3}
10-07	Ambient: Adjacent to Clean Room (Stairwell Landing)		1371	<0.01	Result below the project requirement. ^{1, 2, 3}
10-08	Ambient: Lab NE		1345	<0.01	Result below the project requirement. ^{1, 2, 3}
10-09	Occupational on Worker:		69	4.14	Result below the MUC of the RPE used. ^{4, 5, 6}
14-20	Ambient: Clean Room (within Lab 2)	Building 14	1243	<0.01	Result below the project requirement. ^{1, 2, 3}
14-21	Ambient: Adjacent to Clean Room (within Lab 2)		1247	<0.01	Result below the project requirement. ^{1, 2, 3}
14-22	Ambient: First Floor Entry		1278	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Non-fibrous Particulate – MODERATE.


⁵ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁶ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	7
		Date	Friday, 11 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Clean Room (within Lab 2) – Cement Board, Vinyl Floor Tile and Mastic (Sample 14-23)		
	2. Building 14: Adjacent to Clean Room (within Lab 2) – Cement Board, Vinyl Floor Tile and Mastic (Sample 14-24)		
	3. Building 14: Occupational Sample (Cement Board and Nail Removal) (Sample 14-25)		
	4. Building 10: Clean Room (Top of Second Floor Stairwell) – Drywall Joint Compound (Sample 10-10)		
	5. Building 10: Adjacent Clean Room (Stairwell Landing) – Drywall Joint Compound (Sample 10-11)		
	6. Building 10: Occupational Sample (Final Clean of Work Area) – Drywall Joint Compound (Sample 10-12)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	Moderate	Enviro-Vac completed the moderate-risk abatement of cement board, vinyl floor tile and mastic within Lab 1 and Power Panel room on the north side of the building. A final visual inspection was requested and passed without requiring any additional instructions from Amec Foster Wheeler. Upon passing the inspection, Enviro-Vac applied lockdown glue to the floors, walls and ceilings of the work area. Enviro-Vac then vacated the work area, allowing the lockdown to settle overnight in preparation of air clearance sampling.
Building 10	Moderate	Enviro-Vac continued the moderate-risk abatement of drywall board and joint compound on the second floor of the building. Removal of drywall

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		board in the work area was completed and the final clean was begun. The final clean proceeded for the remainder of the work day. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 26	N.A.	No work was completed in Building 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	Moderate	Amec Foster Wheeler performed an inspection and collected an occupational sample from a worker performing cement board and nail removal on the floor of the work area. Later on in the work day, Amec Foster Wheeler completed a final visual inspection of the work area. All visible asbestos containing materials had been removed from the work area, with the exception of approximately 2 m ² of cement board behind the building power panels. These materials will be removed under low-risk procedures following removal of the panels from the building by a licenced electrician. Amec Foster Wheeler determined that the work area was sufficiently clean and the inspection was passed.
Building 10	Moderate	Amec Foster Wheeler completed an inspection of the second floor work area and worker activities. Bulk materials had been removed and workers were performing final clean. Housekeeping was observed to be satisfactory. An occupational sample from a worker performing final cleaning duties was collected. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 26	N.A.	No work was completed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instruction were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-23	Ambient: Clean Room (within Lab 2)	Building 14	1202	<0.01	Result below the project requirement. ^{1, 2, 3}
14-24	Ambient: Adjacent to Clean Room (within Lab 2)		1226	<0.01	Result below the project requirement. ^{1, 2, 3}
14-25	Occupational on Worker: Cement Board and Nail Removal		51	0.11	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
10-10	Ambient: Clean Room (Top of Stairwell)	Building 10	1363	<0.01	Result below the project requirement. ^{1, 2, 3}
10-11	Ambient: Adjacent to Clean Room (Stairwell Landing)		1313	<0.01	Result below the project requirement. ^{1, 2, 3}
10-12	Occupational on Worker: Final Clean of Work Area		67	0.87	Result below the MUC of the RPE used. ^{3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	8
		Date	Saturday, 12 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Air Clearance in Lab 1 / Power Panel Room – Cement Board, Vinyl Floor Tile and Mastic (Sample 14-26)		
	2. Building 26: Adjacent to Threshing Room (Main Hall) – Drywall Board and Joint Compound (Sample 26-03)		
	3. Building 26: Occupational Sample (Drywall Board and Joint Compound) (Sample 26-04)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26	Moderate	Setup for the high-risk abatement of vermiculite within the ceiling space began and continued throughout the work day. Upon passing the pre-contamination inspection, moderate-risk abatement of mould-impacted drywall board and joint compound within the Threshing Room began at midday and continued for the remainder of the work day.
Building 10	Moderate	Enviro-Vac continued the moderate-risk abatement of drywall board and joint compound on the second floor of the building. Final clean continued until approximately mid-day. The work area entrance was then sealed up with 6 mil poly and duct tape and will undergo final inspection along with the first floor once the moderate-risk abatement for the entire building is complete. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 14	Low	Upon passing the air clearance sampling, Enviro-Vac performed low-risk teardown of Lab 1 / Power Panel room work area.

Notes: N.A. = Not applicable.



Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate	Amec Foster Wheeler performed a pre-contamination inspection on the moderate-risk work area within the Threshing Room. No deficiencies were identified and the inspection was passed. An occupational sample was collected from the worker performing the removal activities within the Threshing Room.
Building 10	Moderate	Amec Foster Wheeler declined to perform an inspection or ambient air monitoring as the bulk material had been removed from the work area and final cleaning activities were underway. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 14	Moderate	Amec Foster Wheeler collected and analyzed an air clearance sample from the Lab 1 / Power Panel room work area. Analysis determined that the samples were below 0.01 f/cc of asbestos and Enviro-Vac was given permission to enter the work area without asbestos personal protective equipment (PPE).

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instruction were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-26	Ambient: Air Clearance in Lab 1 / Power Panel Room	Building 14	3371	<0.01	Result below the project requirement. ^{1, 2, 3}
14-24	Ambient: Adjacent to Threshing Room (Main Hall)	Building 26	610	<0.01	Result below the project requirement. ^{1, 2, 3}
14-25	Occupational on Worker: Drywall Board and Joint Compound in Threshing Room		50	0.08	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.


⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	9
		Date	Monday, 14 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (First Floor Work Area) – Drywall Board and Joint Compound (Sample 10-13)		
	2. Building 10: Adjacent to Clean Room (First Floor Work Area) – Drywall Board and Joint Compound (Sample 10-14)		
	3. Building 10: Basement Ambient (First Floor Work Area) – Drywall Board and Joint Compound (Sample 10-15)		
	4. Building 10: Occupational Sample (First Floor Work Area) – Drywall Board and Joint Compound Cleanup (Sample 10-16)		
	5. Building 10: Occupational Sample (First Floor Work Area) – Drywall Board and Joint Compound Removal (Sample 10-17)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Enviro-Vac continued the moderate-risk abatement of drywall board and joint compound on the first floor of the building. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 14	N.A.	No work was performed in Building 14.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.



Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler performed an inspection within the first floor work area. Good housekeeping practices were observed which helped to control visible dust within the work area. Amec Foster Wheeler collected two occupational samples, one from a worker performing cleanup activities and another from a worker performing removal activities. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 14	N.A.	No work was performed in Building 14.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instruction were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-13	Ambient: Clean Room (First Floor Work Area)	Building 10	1394	<0.01	Result below the project requirement. ^{1, 2, 3}
10-14	Ambient: Adjacent to Clean Room (First Floor Work Area)		1397	<0.01	Result below the project requirement. ^{1, 2, 3}
10-15	Ambient: Basement (In Support of Activities on First Floor Work Area)		1351	<0.01	Result below the project requirement. ^{1, 2, 3}
10-16	Occupational on Worker: Drywall Board and Joint Compound Cleanup in First Floor Work Area		51	1.27	Result below the MUC of the RPE used. ^{3, 5, 6}
10-17	Occupational on Worker: Drywall Board and Joint Compound Removal in First Floor Work Area		50	1.88	Result below the MUC of the RPE used. ^{4, 5, 6}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.


⁴ Non-fibrous Particulate – MODERATE.

⁵ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁶ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

Amec Foster Wheeler is a participant in the Canadian Association for Laboratory Accreditation (CALA) Inc. Proficiency Testing Program for Environmental Laboratories. Analytical methods used by Amec Foster Wheeler and their associate laboratories are those recommended by NIOSH or prescribed by the Alberta Provincial Government. Sample collection and analysis was completed in accordance with NIOSH 7400 Analytical Method (A Counting Rules).

HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	10
		Date	Tuesday, 15 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Furnace Room Boiler Work Area) – Insulation (Sample 10-18)		
	2. Building 10: Adjacent to Clean Room (Furnace Room Boiler Work Area) – Insulation (Sample 10-19)		
	3. Building 10: Storage 1 (Furnace Room Boiler Work Area) – Insulation (Sample 10-20)		
	4. Building 10: Occupational Sample (Furnace Room Boiler Work Area) – Insulation (Sample 10-20)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	High	Enviro-Vac halted the moderate-risk abatement of drywall board and joint compound on the first floor of the building. The work area remained restricted and the abatement will be resumed at a later date. Enviro-Vac constructed a containment system within the Furnace Room for the high-risk abatement of boiler insulation. The containment was equipped with a three-stage mobile decontamination unit and a single HEPA negative air unit. Negative pressure was maintained within the containment at 0.5 mm H ₂ O (5 pa) and continuously measured using a digital barometer. Upon passing the pre-contamination inspection, Enviro-Vac began removal activities, which continued for the remainder of the work day. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 14	N.A.	No work was performed in Building 14.
Building 26	N.A.	No work was performed in Building 26.



Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	High	<p>Amec Foster Wheeler performed a pre-contamination inspection of the Furnace Room work area containment system. The decontamination unit was observed to be in good condition with a functioning shower, including warm and cold water. All seals of the containment were observed to be intact and negative pressure was consistently maintained to the level required by Alberta Occupational Health and Safety. The HEPA negative air unit and vacuum had been DOP tested prior to use. Amec Foster Wheeler collected three ambient air samples which ran throughout the work day once removal activities began. Amec Foster Wheeler returned later in the day to perform an inspection of work activities and collected an occupational air sample from a worker performing insulation removal activities. Work activities were observed to be satisfactory.</p> <p>Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.</p>
Building 14	N.A.	No work was performed in Building 14.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instruction were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-18	Ambient: Clean Room (Furnace Room Boiler Work Area)	Building 10	1090	<0.01	Result below the project requirement. ^{1, 2, 3}
10-19	Ambient: adjacent to Clean Room (Furnace Room Boiler Work Area)		1108	<0.01	Result below the project requirement. ^{1, 2, 3}
10-20	Ambient: Storage 1 (Furnace Room Boiler Work Area)		1104	<0.01	Result below the project requirement. ^{1, 2, 3}
10-21	Occupational on Worker: Insulation Removal in Furnace Room Boiler Work Area		71	<0.01	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

Amec Foster Wheeler is a participant in the Canadian Association for Laboratory Accreditation (CALA) Inc. Proficiency Testing Program for Environmental Laboratories. Analytical methods used by Amec Foster Wheeler and their associate laboratories are those recommended by NIOSH or prescribed by the Alberta Provincial Government. Sample collection and analysis was completed in accordance with NIOSH 7400 Analytical Method (A Counting Rules).

HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	11
		Date	Wednesday, 16 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Occupational Sample (Furnace Room Boiler Work Area) – Insulation (Sample 10-22)		
	2. Building 10: Clean Room (Furnace Room Boiler Work Area) – Insulation (Sample 10-23)		
	3. Building 10: Adjacent to Clean Room (Furnace Room Boiler Work Area) – Insulation (Sample 10-24)		
	4. Building 14: Clean Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-27)		
	5. Building 14: Adjacent to Clean Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-28)		
	6. Building 14: Waste Transfer Station (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-29)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	High	Enviro-Vac completed the high-risk removal of boiler insulation and performed a final clean of the work area in preparation for a final visual inspection from Amec Foster Wheeler. Upon addressing the issues raised, the inspection was passed. Enviro-Vac applied lockdown glue to the work area in preparation for air clearance sampling.
Building 14	High	Enviro-Vac constructed a containment system encompassing several rooms on the main floor for the high-risk abatement of vinyl sheet flooring. The containment was equipped with a three-stage mobile decontamination unit and two HEPA negative air units. Negative



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		pressure was maintained within the containment at 0.5 mm H ₂ O (5 pa) and was continuously measured using a digital barometer. Upon passing the pre-contamination inspection, Enviro-Vac began removal activities, which continued for the remainder of the work day. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	High	Upon completion of the final clean, Amec Foster Wheeler performed a final visual inspection of the abatement work performed on the boiler within the Furnace Room work area. It was observed that cement mortar was present between the iron casts of the boiler and this material was sampled to be determined if it is asbestos-containing. Minor issues were observed regarding insulation debris which were promptly addressed by Enviro-Vac and the inspection was passed. During the inspection and subsequent cleaning activities, Amec Foster Wheeler collected an occupational air sample from the worker. Amec also collected two ambient air samples which ran throughout the work day.
Building 14	High	Amec Foster Wheeler performed a pre-contamination inspection of the First Floor work area containment system. The decontamination unit was observed to be in good condition with a functioning shower, including warm and cold water. All seals of the containment were observed to be intact and negative pressure was consistently maintained to the level required by Alberta Occupational Health and Safety. The HEPA negative air unit and vacuum had been DOP tested prior to use. No issues were observed and the inspection was passed. Amec Foster Wheeler collected three ambient air samples which ran throughout the work day once removal activities began. Within the First Floor and Second Floor work areas, Amec Foster Wheeler collected four (4) samples of paper backing from beneath the floor tile layers present on both floors for asbestos analysis. Amec Foster Wheeler was onsite from approximately 07:30 to 09:30, from 10:00 to 12:00, from 13:00 to 14:50 and from 15:00 to 17:30.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1.	Amec Foster Wheeler observed minor amounts of insulation debris within the main chamber. Enviro-Vac promptly removed the insulation and cleaned the chamber.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-22	Occupational Sample on Worker: Insulation Removal in Furnace Room Boiler Work Area	Building 10	71	<0.04	Result below the MUC of the RPE used. ^{1, 2, 3, 4}
10-23	Ambient: Clean Room (Furnace Room Boiler Work Area)		1363	<0.01	Result below the project requirement. ^{1, 2, 5}
10-24	Ambient: Adjacent to Clean Room (Furnace Room Boiler Work Area)		1391	<0.01	Result below the project requirement. ^{1, 2, 5}
14-27	Ambient: Clean Room (Main Floor Work Area)	Building 14	405	<0.01	Result below the project requirement. ^{1, 2, 5}
14-28	Ambient: Adjacent Clean Room (Main Floor Work Area)		407	<0.01	Result below the project requirement. ^{1, 2, 5}
14-29	Ambient: Waste Transfer Station (Main Floor Work Area)		405	<0.01	Result below the project requirement. ^{1, 2, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Underloaded fibres – Underloaded – May Have Positive Bias.

² Non-fibrous Particulate – LOW.

³ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁴ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

⁵ Project requirement = 0.01 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	12
		Date	Thursday, 17 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Air Clearance Sample (Furnace Room Boiler Work Area) – Insulation (Sample 10-25)		
	2. Building 14: Clean Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-30)		
	3. Building 14: Adjacent to Clean Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-31)		
	4. Building 14: Waste Transfer Station (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-32)		
	5. Building 14: Occupational Sample (Main Floor Work Area) – Vinyl Sheet Flooring Removal (Sample 14-33)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	High	Enviro-Vac continued with removal of vinyl sheet flooring for the remainder of the work day. A previously unidentified layer of 22.9 cm (9 inch) floor tile and black mastic was observed beneath the vinyl sheet flooring layer, of which Enviro-Vac informed Amec Foster Wheeler. Enviro-Vac removed the tile and disposed of it as asbestos waste along with the vinyl sheet flooring. The black mastic was left in place, with its removal to be determined by its asbestos content. Enviro-Vac was onsite from approximately 07:30 to 17:30.
Building 10	N.A.	No work was performed in Building 10.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	High	Amec Foster Wheeler collected and analyzed an air clearance sample from the Furnace Room work area. Analysis determined that the sample was below 0.01 f/cc and Enviro-Vac was given permission to enter the work area without asbestos personal protective equipment (PPE).
Building 14	High	Amec Foster Wheeler performed an inspection of the First Floor work area. All seals of the containment were observed to be intact and negative pressure was consistently maintained at 0.5 mm H ₂ O (5 pa). Amec Foster Wheeler collected three ambient air samples which ran for the majority of the work day during removal activities. An occupational sample was also collected from a worker performing vinyl sheet flooring removal. A bulk sample of the previously unidentified black mastic from the Entry area was collected for asbestos analysis. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-25	Air Clearance: Furnace Room Boiler Work Area	Building 10	3676	<0.01	Result below the project requirement. ^{1, 2, 3}
14-30	Ambient: Clean Room (Main Floor Work Area)	Building 14	1364	<0.01	Result below the project requirement. ^{1, 2, 3}
14-31	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1363	<0.01	Result below the project requirement. ^{1, 2, 3}
14-32	Ambient: Waste Transfer Station (Main Floor Work Area)		1387	<0.01	Result below the project requirement. ^{1, 2, 3}
14-33	Occupational Sample on Worker: Vinyl Sheet Flooring Removal (Main Floor Work Area)		72	<0.04	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	13
		Date	Friday, 18 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Clean Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-34)		
	2. Building 14: Adjacent to Clean Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-35)		
	3. Building 14: Waste Transfer Station (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-36)		
	4. Building 14: Occupational Sample (Main Floor Work Area) – Vinyl Sheet Flooring Removal (Sample 14-37)		
	5. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-26)		
	6. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-27)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	High	Enviro-Vac completed the removal of vinyl sheet flooring and performed a final clean for the work area in preparation of final visual inspection. The inspection was passed and Enviro-Vac applied lockdown glue to the work area surfaces in preparation for air clearance sampling.
Building 10	Moderate	Moderate-risk drywall board and joint compound removal resumed within the Main Floor work area. Enviro-Vac removed debris and cleaned as it was generated in order to control dust levels within the work area.
Building 26	N.A.	Setup for high-risk vermiculite abatement in the attic resumed. Included was the assembly of a waste transfer station located at the east end of

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		the building within the Main Hall. Enviro-Vac was onsite from approximately 07:30 to 17:30

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	High	Amec Foster Wheeler performed an inspection of the First Floor work area and collected an occupational air sample from a worker performing final clean activities. Amec Foster Wheeler collected three ambient air samples in support of the high-risk abatement activities in the work area. Upon completion of the final clean, a final visual inspection of the work area was performed. No issues were observed and the inspection was passed. Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 10	Moderate	Amec Foster Wheeler collected two ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities within the Main Floor work area.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-34	Ambient: Clean Room (Main Floor Work Area)	Building 14	1232	<0.01	Result below the project requirement. ^{1, 2, 3}
14-35	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1214	<0.01	Result below the project requirement. ^{1, 2, 3}
14-36	Ambient: Waste Transfer Station (Main Floor Work Area)		1241	<0.01	Result below the project requirement. ^{1, 2, 3}
14-37	Occupational Sample on Worker: Final Clean (Main Floor Work Area)		69	0.07	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
10-26	Ambient: Clean Room (Main Floor Work Area)	Building 10	703	<0.01	Result below the project requirement. ^{1, 2, 3}
10-27	Ambient: Adjacent to Clean Room (Main Floor Work Area)		739	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	14
		Date	Saturday, 19 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Air Clearance in Entry Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-38)		
	2. Building 14: Air Clearance in NE Lab (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-39)		
	3. Building 14: Air Clearance in Growth Chamber Room (Main Floor Work Area) – Vinyl Sheet Flooring (Sample 14-40)		
	5. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-28)		
	6. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-29)		
	6. Building 10: Basement Ambient (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-30)		
	4. Building 14: Occupational Sample (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-31)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Moderate-risk drywall board and joint compound removal continued within the Main Floor work area. Enviro-Vac removed debris and cleaned as it was generated in order to control dust levels within the work area.
Building 26	N.A.	Setup for high-risk vermiculite abatement in the attic continued. Enviro-Vac was onsite from approximately 07:30 to 17:30

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	N.A.	No work was performed by Enviro-Vac in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 14	High	Amec Foster Wheeler collected and analyzed three clearance samples from the Main Floor work area. Analysis determined that the samples were below 0.01 f/cc and Enviro-Vac was given permission to enter the work area without asbestos personal protective equipment (PPE). Amec Foster Wheeler was onsite from approximately 07:30 to 12:00, and again from 13:00 to 17:30.
Building 10	Moderate	Amec Foster Wheeler collected three ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities within the Main Floor work area. A general inspection of the work area and work practices was performed. Housekeeping within the work area was satisfactory, as were the safe work practices of the workers. During the inspection, Amec Foster Wheeler collected an occupational air sample from a worker performing drywall board removal.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/ Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-38	Air Clearance: Entry Room (Main Floor Work Area)	Building 14	3241	<0.01	Result below the project requirement. ^{1, 2, 3}
14-39	Air Clearance: NE Lab (Main Floor Work Area)		3377	<0.01	Result below the project requirement. ^{1, 2, 3}
14-40	Air Clearance: Growth Chamber Room (Main Floor Work Area)		3356	<0.01	Result below the project requirement. ^{1, 2, 3}
10-28	Ambient: Clean Room (Main Floor Work Area)	Building 10	1344	<0.01	Result below the project requirement. ^{1, 2, 3}

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-29	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1369	<0.01	Result below the project requirement. ^{1, 2, 3}
10-30	Ambient: Basement (Main Floor Work Area)		1360	<0.01	Result below the project requirement. ^{1, 2, 3}
10-31	Occupational Sample on Worker: Final Clean (Main Floor Work Area)		70	1.45	Result below the MUC of the RPE used. ^{3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

Amec Foster Wheeler is a participant in the Canadian Association for Laboratory Accreditation (CALA) Inc. Proficiency Testing Program for Environmental Laboratories. Analytical methods used by Amec Foster Wheeler and their associate laboratories are those recommended by NIOSH or prescribed by the Alberta Provincial Government. Sample collection and analysis was completed in accordance with NIOSH 7400 Analytical Method (A Counting Rules).

HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	15
		Date	Monday, 21 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-32)		
	2. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-33)		
	3. Building 10: Basement Ambient (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-34)		
	4. Building 14: Occupational Sample (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-35)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Moderate-risk drywall board and joint compound removal continued within the Main Floor work area. Enviro-Vac removed debris and cleaned as it was generated in order to control dust levels within the work area.
Building 26	N.A.	Setup for high-risk vermiculite abatement in the attic continued. Enviro-Vac was onsite from approximately 07:30 to 17:30
Building 14	N.A.	No work was performed by Enviro-Vac in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler collected three ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities within the Main Floor work area. A general inspection of the work area and work practices was performed. Housekeeping within the work area was satisfactory, as were the safe work practices of the workers. During the inspection, Amec Foster Wheeler collected an occupational air sample from a worker performing drywall board removal.
Building 14	N.A.	No work was performed in Building 14
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-32	Ambient: Clean Room (Main Floor Work Area)	Building 10	1276	<0.01	Result below the project requirement. ^{1, 2, 3}
10-33	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1273	<0.01	Result below the project requirement. ^{1, 2, 3}
10-34	Ambient: Basement (Main Floor Work Area)		1319	<0.01	Result below the project requirement. ^{1, 2, 3}
10-35	Occupational Sample on Worker: Drywall Removal (Main Floor Work Area)		70	0.81	Result below the MUC of the RPE used. ^{3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the



hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	16
		Date	Tuesday, 22 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-36)		
	2. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-37)		
	3. Building 10: Basement Ambient (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-38)		
	4. Building 14: Occupational Sample (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-39)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Moderate-risk drywall board and joint compound removal continued within the Main Floor work area, removal work also began on the Basement portion of the work area. Enviro-Vac removed debris and cleaned as it was generated in order to control dust levels within the work area.
Building 26	N.A.	Setup for high-risk vermiculite abatement in the attic continued. Enviro-Vac was onsite from approximately 07:30 to 17:30
Building 14	N.A.	No work was performed by Enviro-Vac in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler collected three ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities. A general inspection of the work area and work practices was performed. Housekeeping within the work area was satisfactory, as were the safe work practices of the workers. During the inspection, Amec Foster Wheeler collected an occupational air sample from a worker performing cleaning of debris.
Building 14	N.A.	No work was performed in Building 14
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-36	Ambient: Clean Room (Main Floor Work Area)	Building 10	1311	<0.01	Result below the project requirement. ^{1, 2, 3}
10-37	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1316	<0.01	Result below the project requirement. ^{1, 2, 3}
10-38	Ambient: Basement (Main Floor Work Area)		1318	<0.01	Result below the project requirement. ^{1, 2, 3}
10-39	Occupational Sample on Worker: Cleaning of Debris (Main Floor Work Area)		71	0.80	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned



protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	17
		Date	Wednesday, 23 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Stephen Barber, Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-40)		
	2. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-41)		
	3. Building 10: Basement Ambient (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-42)		
	4. Building 10: Occupational Sample (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-43)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Moderate-risk drywall board and joint compound removal continued within the Main Floor work area and final cleaning began on the 2 nd floor portion of the work area. Enviro-Vac removed debris and cleaned as it was generated in order to control dust levels within the work area.
Building 26	N.A.	Setup for high-risk vermiculite abatement in the attic continued. Enviro-Vac was onsite from approximately 07:30 to 17:30
Building 14	N.A.	No work was performed by Enviro-Vac in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler collected three ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities. A general inspection of the work area and work practices was performed. Housekeeping within the work area was satisfactory, as were the safe work practices of the workers. During the inspection, Amec Foster Wheeler collected an occupational air sample from a worker performing cleaning of debris.
Building 14	N.A.	No work was performed in Building 14
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued by Amec Foster Wheeler on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-40	Ambient: Clean Room (Main Floor Work Area)	Building 10	1334	<0.01	Result below the project requirement. ^{1, 2, 3}
10-41	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1358	<0.01	Result below the project requirement. ^{1, 2, 3}
10-42	Ambient: Basement (Main Floor Work Area)		1353	<0.01	Result below the project requirement. ^{1, 2, 3}
10-43	Occupational Sample on Worker: Cleaning of Debris (Main Floor Work Area)		79	0.37	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned



protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	18
		Date	Thursday, 24 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-44)		
	2. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-45)		
	3. Building 10: Occupational Sample (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-46)		
	4. Building 14: Clean Room (Main Floor Work Area) – Plywood Board and Joint Compound (Sample 14-41)		
	5. Building 14: Adjacent to Clean Room (Main Floor Work Area) – Plywood Board and Joint Compound (Sample 10-42)		
	6. Building 14: Occupational Sample (Basement Work Area) – Plywood Board and Joint Compound (Sample 10-43)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Re-location of two stage decontamination unit occurred to accommodate Moderate-risk drywall board and joint compound removal within the Main Floor work area and stairwell. Final cleaning continued throughout the 2 nd floor portion of the work area. Enviro-Vac bagged all debris and cleaned as debris was generated in order to control dust levels within the work area.
Building 26	N.A.	No work was performed in Building 26.
Building 14	Moderate	Moderate-risk plywood ceiling board and joint compound removal continued within the Basement work area. Enviro-Vac removed debris



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		and cleaned as it was generated, in order to control dust levels within the work area. Final cleaning activities were initiated upon completion of removal.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler collected two ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities. A general inspection of the work area and work practices was performed. Housekeeping within the work area was satisfactory, as were the safe work practices of the workers. During the inspection, Amec Foster Wheeler collected an occupational air sample from a worker performing cleaning of debris.
Building 14	Moderate	Amec Foster Wheeler collected two ambient air monitoring samples in support of the moderate-risk plywood board (ceiling) and joint compound abatement activities. Amec Foster Wheeler collected an occupational air sample from a worker performing abatement and cleaning of debris.
Building 26	N.A.	No work was performed in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	Amec Foster Wheeler granted permission for contractor to apply surface sealant (i.e. glue-fog) in Building 10 and Building 14, upon passing Final Clean Inspection.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-44	Ambient: Clean Room (Main Floor Work Area)	Building 10	1468	<0.01	Result below the project requirement. ^{1, 2, 3}
10-45	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1420	<0.01	Result below the project requirement. ^{1, 2, 3}
10-46	Occupational Sample on Worker: Cleaning of Debris (Main Floor Work Area)		48	4.97	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-41	Ambient: Clean Room (Main Floor Work Area)	Building 14	965	<0.01	Result below the project requirement. ^{1, 2, 3}
14-42	Ambient: Adjacent to Clean Room (Main Floor Work Area)		3526	<0.01	Result below the project requirement. ^{1, 2, 3}
14-43	Occupational Sample on Worker: Abatement work (Main Floor Work Area)		77	0.07	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	19
		Date	Friday, 25 November 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 10: Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-47)		
	2. Building 10: Adjacent to Clean Room (Main Floor Work Area) – Drywall Board and Joint Compound (Sample 10-48)		
	3. Building 10: Occupational Sample (Main Floor Work Area) – Final Cleaning & Waste Transfer Activities (Sample 10-49)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	Final cleaning continued throughout all portions of the work area. Enviro-Vac performed waste transfer activities (bag-out) and upon passing Final Clean Inspection, performed application of surface sealant (glue-fog)
Building 26	N.A.	Setup for high-risk vermiculite abatement in the attic continued. Enviro-Vac was onsite from approximately 07:30 to 17:00
Building 14	Moderate	Enviro-Vac passed Final Clean Inspection, then performed application of surface sealant (glue-fog)

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler collected three ambient air monitoring samples in support of the moderate-risk drywall board and joint compound abatement activities, as well as an occupational air sample from a worker performing waste transfer activities. A Final Clean Inspection of the work area was performed. Abatement within the work area was deemed complete, permission was granted to contractor to apply surface sealant (glue-fog).
Building 14	N.A.	Amec Foster Wheeler performed a Final Clean Inspection of the work area, permission was granted to contractor to apply surface sealant (glue-fog).
Building 26	N.A.	No work was performed by Amec Foster Wheeler in Building 26.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	Amec Foster Wheeler granted permission for contractor to apply surface sealant (i.e. glue-fog) in Building 10 and Building 14, upon passing Final Clean Inspection.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/ Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
10-47	Ambient: Clean Room (Main Floor Work Area)	Building 10	1295	0.01	Result below the project requirement. ^{1, 2, 3}
10-48	Ambient: Adjacent to Clean Room (Main Floor Work Area)		1318	<0.01	Result below the project requirement. ^{1, 2, 3}
10-49	Occupational Sample on Worker: Waste transfer, final cleaning (Main Floor Work Area)		36	0.11	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.


⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	20
		Date	Monday, 28 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 14: Air Clearance Sample (Basement Floor Work Area) – Post Ceiling Board and Joint Compound Abatement (Sample 14-44)		
	2. Building 14: Air Clearance Sample (Basement Floor Work Area) – Post Ceiling Board and Joint Compound Abatement (Sample 14-45)		
	3. Building 14: Air Clearance Sample (Basement Floor Work Area) – Post Ceiling Board and Joint Compound Abatement – (Sample 14-46)		
	4. Building 26: Clean Room (Main Floor, Lab. 2) – Transite Laboratory Bench (Sample 26-05)		
	5. Building 26: Adjacent to Clean Room (Main Floor, Main Hall: West) – Transite Laboratory Bench (Sample 26-06)		
	6. Building 26: Ambient (Main Floor, Main Hall: East) – Adjacent to Floor Tile removal (Office 2) and HEPA vacuuming/wipe-down of Vermiculite debris (Seed Storage, Furnace) (Sample 26-07)		
	7. Building 26: Occupational Sample (Main Floor, Lab. 2) - Transite Laboratory Bench (Sample 26-08)		
	8. Building 26: Occupational Sample (Main Floor, Seed Storage) - HEPA vacuuming/wipe-down of Vermiculite debris (Sample 26-09)		
	9. Building 26: Occupational Sample (Main Floor, Lab. 2) – Floor Tile removal (Sample 26-10)		
	10. Building 10: Air Clearance Sample (Main Floor Work Area, Lab NE) – Post Drywall Board and Joint Compound Abatement (Sample 10-50)		
	11. Building 10: Air Clearance Sample (Main Floor Work Area, Lab SW) – Post Drywall Board and Joint Compound Abatement (Sample 10-51)		
	12. Building 10: Air Clearance Sample (Upper Floor Work Area, Office 1) – Post Drywall Board and Joint Compound Abatement (Sample 10-52)		

	13. Building 10: Air Clearance Sample (Upper Floor Work Area, Washroom 1) – Post Drywall Board and Joint Compound Abatement (Sample 10-53)
	14. Building 10: Air Clearance Sample (Basement Floor Work Area, Storage 6) – Post Floor Tile & Drywall Board and Joint Compound Abatement (Sample 10-54)

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Moderate	No work performed by contractor in Building 10.
Building 26	Low - Moderate	Removal of Transite laboratory bench in Lab 2. HEPA vacuuming of vermiculite debris and equipment wipe down in Furnace room and Seed Storage room. Floor Tile removal in Office 2. Enviro-Vac was onsite from approximately 07:30 to 17:30
Building 14	Moderate	No work performed by contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 10	Moderate	Amec Foster Wheeler collected five Air Clearance air monitoring samples in support of the completed moderate-risk drywall board and joint compound abatement activities.
Building 14	Moderate	Amec Foster Wheeler collected three Air Clearance air monitoring samples in support of the completed moderate-risk ceiling board and joint compound abatement activities.
Building 26	Low - Moderate	Amec Foster Wheeler collected three ambient air monitoring samples in support of transite removal, floor tile removal and vacuuming of vermiculite debris. Amec Foster Wheeler also collected three occupational samples on workers performing each of the abovementioned activities.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	Amec Foster Wheeler granted permission for contractor to perform Tear-down activities of containments within buildings 10 and 14, upon meeting Air Clearance criteria.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
14-44	Clearance: Basement, West End	Building 14	3634	<0.01	Result below the project requirement. ^{1, 2, 3}
14-45	Clearance: Basement, Center		3702	<0.01	Result below the project requirement. ^{1, 2, 3}
14-46	Clearance: Basement, East End		3746	<0.01	Result below the project requirement. ^{1, 2, 3}
10-50	Clearance: Main Floor, Lab NE	Building 10	4498	<0.01	Result below the project requirement. ^{1, 2, 3}
10-51	Clearance: Main Floor, Lab SW		2577	<0.01	Result below the project requirement. ^{1, 2, 3}
10-52	Clearance: 2 nd Floor, Office 1		1363	<0.01	Result below the project requirement. ^{1, 2, 3}
10-53	Clearance: 2 nd Floor, Washroom 1		4272	<0.01	Result below the project requirement. ^{1, 2, 3}
10-54	Clearance: Basement, Storage 6		4398	<0.01	Result below the project requirement. ^{1, 2, 3}
26-05	Ambient: Clean Room (Main Floor, Lab 2)	Building 26	594	<0.01	Result below the project requirement. ^{1, 2, 3}
26-06	Ambient: Adjacent to Clean Room (Main Floor, Main Hall: West End)		1058	0.01	Result below the project requirement. ^{1, 2, 3}
26-07	Ambient: Adjacent to Floor Tile Removal (Main Floor, Main Hall: East End)		1016	0.01	Result below the project requirement. ^{1, 2, 3}
26-08	Occupational Sample on Worker: Transite lab bench removal (Main Floor, Lab 2 Work Area)		70	0.05	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
26-09	Occupational Sample on Worker: Vermiculite debris vacuum (Main Floor, Seed Storage Work Area)		45	0.10	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
26-10	Occupational Sample on Worker: Floor Tile removal (Main Floor, Office 2 Work Area)		75	0.15	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	21
		Date	Tuesday, 29 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 26: Clean Room (Main Hall, East End) – Attic Preparations (i.e. HEPA Vacuuming walk-way etc. (Sample 26-11)		
	2. Building 26: Adjacent to Clean Room (Main Hall, East End) – Attic Preparations (i.e. HEPA Vacuuming walk-way etc.) (Sample 26-12)		
	3. Building 26: Occupational Sample (Attic) – Attic Preparations (i.e. HEPA Vacuuming walk-way etc.) (Sample 26-13)		
	4. Building 14: Clean Room (Basement Work Area) – Plywood Board and Joint Compound (Sample 14-47)		
	5. Building 14: Adjacent to Clean Room (Basement Work Area) – Plywood Board and Joint Compound (Sample 10-48)		
	6. Building 14: Occupational Sample (Basement Work Area) – Plywood Board and Joint Compound (Sample 10-49)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	N.A.	No work was performed by contractor in Building 10.
Building 26	Moderate	Contractor performed pre-abatement preparation work inside East End containment, including HEPA vacuuming of attic walk-way and waste transfer of double-bagged debris and contaminated materials (i.e. seed bags).
Building 14	Moderate	Moderate-risk plywood wall board and joint compound removal was initiated within the Basement work area. Enviro-Vac removed and wrapped wall board and cleaned debris as it was generated, in order to

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		control dust levels within the work area. Final cleaning activities were initiated upon completion of removal.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate	Amec Foster Wheeler obtained two (2) ambient air monitoring samples in support of attic preparation work for upcoming abatement. One (1) occupational air monitoring sample was collected on a worker performing cleaning/prep activities.
Building 14	Moderate	Amec Foster Wheeler collected two (2) ambient air monitoring samples in support of the moderate-risk plywood board (wall covering) and joint compound abatement activities. Amec Foster Wheeler collected one (1) occupational air monitoring sample from a worker performing abatement and cleaning of debris. A Final Clean Inspection was performed, upon completion of Final Clean activities
Building 10	N.A.	No work was performed in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	Amec Foster Wheeler granted permission for contractor to apply surface sealant (i.e. glue-fog) in Building 14, upon passing Final Clean Inspection.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-11	Ambient: Clean Room (Main Hall, East End)	Building 26	1531	<0.01	Result below the project requirement. ^{1, 2, 3}
26-12	Ambient: Adjacent to Clean Room (Main Hall, East End)		1517	<0.01	Result below the project requirement. ^{1, 2, 3}
26-13	Occupational Sample on Worker: Cleaning of Debris (Attic Work Area)		76	0.05	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-47	Ambient: Clean Room (Basement Work Area)	Building 14	627	<0.01	Result below the project requirement. ^{1, 2, 3}
14-48	Ambient: Adjacent to Clean Room (Basement Work Area)		627	<0.01	Result below the project requirement. ^{1, 2, 3}
14-49	Occupational Sample on Worker: Abatement work (Basement Work Area)		40	0.23	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	22
		Date	Wednesday, 30 November 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Air Sample Locations	1. Building 26: Background (Main Hall, East End) – Prior to High Risk vermiculite abatement (Sample 26-14)		
	2. Building 26: Background (Main Hall, West End) – Prior to High Risk vermiculite abatement (Sample 26-15)		
	3. Building 26: Clean Room (Main Floor Work Area, West Containment) – High Risk vermiculite abatement (Sample 26-16)		
	4. Building 26: Adjacent to Clean Room (Main Floor Work Area, West Containment) - High Risk vermiculite abatement (Sample 26-17)		
	5. Building 26: Occupational Sample (Main Floor Work Area, West Containment) – – High Risk vermiculite abatement (Sample 26-18)		
	6. Building 26: Clean Room (Main Floor Work Area, East Containment) – High Risk vermiculite abatement (Sample 26-19)		
	7. Building 26: Adjacent to Clean Room (Main Floor Work Area, East Containment) - High Risk vermiculite abatement (Sample 26-20)		
	8. Building 26: Occupational Sample (Main Floor Work Area, East Containment) – – High Risk vermiculite abatement (Sample 26-21)		
	9. Building 14: Air Clearance (Basement Work Area, North) – Post Plywood Wall Board and Joint Compound Removal (Sample 14-50)		
	10. Building 14: Adjacent to Clean Room (Basement Work Area, South) – Post Plywood Wall Board and Joint Compound Removal (Sample 14-51)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic & East Containment, West Containment	Moderate High	Contractor initiated High Risk removal activities in afternoon, upon passing Pre-contamination Inspection. Enviro-Vac utilized motorized Hi-volume vacuum with a modified HEPA filtration system, to abate vermiculite from attic space. Vacuum bags were loaded and changed from within the West End containment. Debris was cleaned as it was generated in order to control dust levels within the work area.
Building 10	N.A.	No work was performed by Contractor in Building 26.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler performed a Pre-contamination Inspection of the high-risk West End containment. Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite abatement activities (i.e. vacuuming and bagging). Amec Foster Wheeler collected two (2) occupational air samples, one from a worker performing cleaning of general debris in Attic and one from a worker loading and changing vacuum bags in the West End containment.
Building 14	Moderate	Amec Foster Wheeler collected two (2) Air Clearance air monitoring samples in support of re-occupying the basement work area post completion of moderate-risk plywood wall board and joint compound abatement activities.
Building 10	N.A.	No work was performed in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	Amec Foster Wheeler granted permission for contractor to initiate high volume vacuuming of vermiculite and associated high-risk bagging activities from within the West End containment of Building 26, upon passing Pre-contamination Inspection.
B)	Amec Foster Wheeler instructed contractor to HEPA vacuum and perform a wet wipe-down of the high-risk West end containment Clean Room in Building 26, upon identifying elevated ambient air monitoring result (0.03 f/cc). Note: Fibres observed in West end containment Clean Room did not visually resemble vermiculite fibres observed on occupational sample obtained from within the West end containment. Suspect fibres may have been generated from excessive cotton towel use in Clean Room. Based on PCM analytical method, the fibre types could not be confirmed.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-14	Background: Pre-abatement (Main Hall, East end)	Building 26	3079	<0.01	Result below the project requirement. ^{1, 2, 3}
26-15	Background: Pre-abatement (Main Hall, West end)		4906	<0.01	Result below the project requirement. ^{1, 2, 3}
26-16	Ambient: Clean Room (West end containment)		649	0.03	Result above the project requirement. ^{1, 2, 3}
26-17	Ambient: Adjacent to Clean Room (Main Hall, West end)		666	<0.01	Result below the project requirement. ^{1, 2, 3}
26-18	Occupational Sample on Worker: Loading and changing vacuum bags (West end containment)		56	5.13	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
26-19	Ambient: Clean Room (East end containment)		1582	<0.01	Result below the project requirement. ^{1, 2, 3}
26-20	Ambient: Adjacent to Clean Room (East end containment)		1615	<0.01	Result below the project requirement. ^{1, 2, 3}
26-21	Occupational Sample on Worker: Cleaning loose debris (Main Floor Work Area)		46	0.17	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
14-50	Air Clearance: Basement Work Area, North	Building 14	3055	<0.01	Result below the project requirement. ^{1, 2, 3}
14-51	Air Clearance: Basement Work Area, South		3055	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.


⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.



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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	23
		Date	Thursday, 01 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Clean Room (Main Floor Work Area, West Containment) – High Risk vermiculite abatement (Sample 26-22)		
	2. Building 26: Adjacent to Clean Room (Main Floor Work Area, West Containment) - High Risk vermiculite abatement (Sample 26-23)		
	3. Building 26: Occupational Sample (Main Floor Work Area, West Containment) – – High Risk vermiculite abatement (Sample 26-24)		
	4. Building 26: Clean Room (Main Floor Work Area, East Containment) – High Risk vermiculite abatement (Sample 26-25)		
	5. Building 26: Adjacent to Clean Room (Main Floor Work Area, East Containment) - High Risk vermiculite abatement (Sample 26-26)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic & East Containment, West Containment	Moderate High	Contractor continued High Risk removal activities in West End Containment. Enviro-Vac utilized motorized Hi-volume vacuum with HEPA system to abate vermiculite from attic space. Vacuum bags were loaded and changed from within the West End containment. Debris was cleaned as it was generated and vacuum bags were reconfigured (i.e. doubled up and placed within a metre bag) in order to control dust levels within the work area.

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	N.A.	No work was performed by Contractor in Building 26.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler performed a Pre-contamination Inspection of the high-risk West End containment. Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite abatement activities (i.e. vacuuming and bagging). Amec Foster Wheeler collected two (2) occupational air samples, one from a worker performing cleaning of general debris in Attic and one from a worker loading and changing vacuum bags in the West End containment.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	Amec Foster Wheeler instructed contractor to HEPA vacuum and perform a wet wipe-down of the high-risk West end containment Clean Room in Building 26, upon identifying continued elevated ambient air monitoring result (0.035 f/cc) and Contractor has complied with request. Note: Fibres observed in West end containment Clean Room do not visually resemble asbestos fibres. Based on PCM analytical method, the fibre types could not be confirmed. Contractor was informed that if results continue to stay elevated, alternative measures will need to be put in place to reduce fibre levels.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-22	Ambient: Clean Room (West end containment)	Building 26	1580	0.035	Result above the project requirement. ^{1, 2, 3}
26-23	Ambient: Adjacent to Clean Room (Main Hall, West end)		1548	<0.01	Result below the project requirement. ^{1, 2, 3}
26-24	Occupational Sample on Worker: Loading and changing vacuum bags (West end containment)		41	0.53	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-25	Ambient: Clean Room (East end containment)		1543	<0.01	Result below the project requirement. ^{1, 2, 3}
26-26	Ambient: Adjacent to Clean Room (East end containment)		1537	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	24
		Date	Friday, 01 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Clean Room (Main Floor Work Area, West Containment) – High Risk vermiculite abatement (Sample 26-27)		
	2. Building 26: Adjacent to Clean Room (Main Floor Work Area, West Containment) - High Risk vermiculite abatement (Sample 26-28)		
	3. Building 26: Clean Room (Main Floor Work Area, East Containment) – Moderate Risk vermiculite abatement activities (Sample 26-29)		
	4. Building 26: Adjacent to Clean Room (Main Floor Work Area, East Containment) - Moderate Risk vermiculite abatement activities (Sample 26-30)		
	5. Building 26: Occupational Sample (Attic Space Work Area, East Containment) – Moderate Risk vermiculite abatement activities (Sample 26-31)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic & East Containment, West Containment	Moderate High	Contractor continued High Risk removal activities in West End Containment. Enviro-Vac utilized motorized Hi-volume vacuum with HEPA system to abate vermiculite from attic space. Vacuum bags were loaded and changed from within the West End containment. Debris was cleaned as it was generated in order to control dust levels within the work area.

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		Moderate Risk activities continued (i.e. manning the suction end of the Hi-vol vacuum and workers bagging the remaining fibreglass insulation and HEPA vacuuming the lingering debris.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler performed a Pre-contamination Inspection of the high-risk West End containment. Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite abatement activities (i.e. vacuuming and bagging). Amec Foster Wheeler collected one (1) occupational air sample, from a worker performing cleaning activities in Attic.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	Amec Foster Wheeler instructed contractor to HEPA vacuum and perform a wet wipe-down of the high-risk West end containment Clean Room in Building 26, upon identifying continued elevated ambient air monitoring result (0.02 f/cc) and Contractor has complied with request. Note: Fibres observed in West end containment Clean Room do not visually resemble asbestos fibres observed on occupational sample obtained from within the West end containment. Based on PCM analytical method, the fibre types could not be confirmed. Contractor was informed that if results continue to stay elevated, alternative measures will need to be put in place to reduce fibre levels.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-27	Ambient: Clean Room (West end containment)	Building 26	1573	0.017	Result above the project requirement. ^{1, 2, 3}
26-28	Ambient: Adjacent to Clean Room (Main Hall, West end)		1592	<0.01	Result below the project requirement. ^{1, 2, 3}
26-29	Ambient: Clean Room (East end containment)		1504	<0.01	Result below the project requirement. ^{1, 2, 3}
26-30	Ambient: Adjacent to Clean Room (East end containment)		1537	<0.01	Result below the project requirement. ^{1, 2, 3}
26-31	Occupational Sample on Worker: Loading and changing vacuum bags (West end containment)		57	0.11	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	25
		Date	Saturday, 03 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Clean Room (Main Floor Work Area, West Containment) – High Risk vermiculite abatement (Sample 26-32)		
	2. Building 26: Adjacent to Clean Room (Main Floor Work Area, West Containment) - High Risk vermiculite abatement (Sample 26-33)		
	3. Building 26: Clean Room (Main Floor Work Area, East Containment) – Moderate Risk vermiculite abatement activities (Sample 26-34)		
	4. Building 26: Adjacent to Clean Room (Main Floor Work Area, East Containment) - Moderate Risk vermiculite abatement activities (Sample 26-35)		
	5. Building 26: Occupational Sample (Attic Space Work Area, East Containment) – Moderate Risk vermiculite abatement activities (Sample 26-36)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic & East Containment, West Containment	Moderate High	Contractor suspended High Risk removal activities in West End Containment, to focus manpower on Moderate-risk abatement activities (i.e. bagging of fibreglass insulation and HEPA vacuuming vermiculite remnants) within the attic space.
Building 10	Low	One (1) worker initiated tear-down activities within Building 10.



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite abatement activities (i.e. vacuuming and bagging). Amec Foster Wheeler collected one (1) occupational air sample, from a worker performing cleaning activities in Attic.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	Note: Fibres observed in previous Clean Room samples from within the West end containment Clean Room were not present. Fibres may have been due to the previous presence of towel drying. Based on PCM analytical method, fibre types cannot be confirmed.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-32	Ambient: Clean Room (West end containment)	Building 26	1401	<0.01	Result above the project requirement. ^{1, 2, 3}
26-33	Ambient: Adjacent to Clean Room (Main Hall, West end)		1566	<0.01	Result below the project requirement. ^{1, 2, 3}
26-34	Ambient: Clean Room (East end containment)		1544	<0.01	Result below the project requirement. ^{1, 2, 3}
26-35	Ambient: Adjacent to Clean Room (East end containment)		1504	<0.01	Result below the project requirement. ^{1, 2, 3}
26-36	Occupational Sample on Worker: Cleaning activities including vacuuming vermiculite remnants (East end containment: Attic space)		42	0.04	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	26
		Date	Monday, 05 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Clean Room (Main Floor Work Area, West Containment) – High Risk vermiculite abatement (Sample 26-37)		
	2. Building 26: Adjacent to Clean Room & Furnace Room (Main Hall, West End) – Moderate Risk drywall abatement activities (Sample 26-38)		
	3. Building 26: Clean Room (Main Floor Work Area, East Containment) – Moderate Risk vermiculite abatement activities (Sample 26-39)		
	4. Building 26: Adjacent to Clean Room & Seed Storage Room (Main Hall, East End) – Moderate risk drywall abatement activities (Sample 26-40)		
	5. Building 26: Occupational Sample (Furnace Room: Adjacent to Main Hall, East End) – Moderate Risk drywall abatement activities (Sample 26-41)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic & East Containment, Furnace Room, Seed Storage Room	Moderate	Contractor continued to suspend High Risk removal activities in West End Containment. Manpower was focused on Moderate-risk drywall abatement activities within rooms located adjacent to the Main Hall and containments (i.e. Furnace Room & Seed Storage Room). Removal of water damaged drywall ceiling and associated ducting in Furnace Room was assisted by worker from within Moderate Risk containment (i.e. attic space).

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 10	Low	Workers continued tear-down and performed various demolition preparation activities within Building 10, including the transport of A/C Unit out of building.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the water damaged drywall abatement/remediation activities (e.g. cutting and sanding of drywall DJC). Amec Foster Wheeler collected one (1) occupational air sample, from a worker performing drywall abatement work in Furnace Room.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
A)	<p>Note: Based on the air sample analysis from samples collected in the Main Hall, it was determined that a minor amount of vermiculite debris had released from a small penetration where a Heating unit equipped with a fan is secured to the ceiling in the Main Hall. The vermiculite had fallen between some new drywall materials stored in the Main Hall and thus were disturbed when the materials were moved for use. Note all air samples results remained below the project requirements.</p> <p>Contractor was instructed to seal the penetration, HEPA vacuum the visible vermiculite debris and switch the Heating unit to OFF for the remaining duration of the work day.</p>

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-37	Ambient: Clean Room (West end containment)	Building 26	1578	<0.01	Result below the project requirement. ^{1, 2, 3}
26-38	Ambient: Adjacent to Clean Room and Furnace Room (Main Hall, West end)		1487	0.015	Result above the project requirement. ^{1, 2, 3}
26-39	Ambient: Clean Room (East end containment)		1539	<0.01	Result below the project requirement. ^{1, 2, 3}
26-40	Ambient: Adjacent to Clean Room and Seed Storage Room (East end containment)		1457	0.016	Result above the project requirement. ^{1, 2, 3}
26-41	Occupational Sample on Worker: Drywall abatement activities (Furnace Room)		55	0.24	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	27
		Date	Tuesday, 06 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Adjacent to Lab 2 (Main Hall, West End) – Low Risk, Wipe-down and Cleaning activities (Sample 26-42)		
	2. Building 26: Adjacent to Lab 1 (Main Hall, East End) – Moderate Risk drywall remediation activities (Sample 26-43)		
	3. Building 26: Occupational Sample (Office 1, East End) – Moderate Risk drywall remediation activities (Sample 26-44)		
	4. Building 26: Occupational Sample (Office 4, East End) – Low Risk, Floor Tile removal (Sample 26-45)		
	5. Building 26: Occupational Sample (Lab 2) - Low Risk, Wipe-down and Cleaning activities (Sample 26-46)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Furnace Room, Seed Storage, Office 1&4, Lab 2	Moderate	Contractor continued to suspend High Risk removal activities in West End Containment. Manpower was focused on Moderate-risk drywall & floor tile abatement activities within rooms located adjacent to the Main Hall (i.e. Furnace Room & Seed Storage Room).
Building 10	Low	No work was performed by Contractor in Building 10.



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler collected two (2) ambient air monitoring samples in support of the water damaged drywall remediation and floor tile removal activities. Amec Foster Wheeler collected three (3) occupational air samples, from workers performing different tasks (i.e. drywall abatement work, floor tile removal and wipe-down cleaning activities).
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were given on this day

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-42	Ambient: Adjacent to Lab 2 (Main Hall: West End)	Building 26	1440	0.01	Result above the project requirement. ^{1, 2, 3}
26-43	Ambient: Adjacent to Lab 1 (Main Hall, East end)		1521	<0.01	Result below the project requirement. ^{1, 2, 3}
26-44	Occupational Sample on Worker: Drywall remediation activities (Lab 1)		78	0.04	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
26-45	Occupational Sample on Worker: Floor Tile abatement activities (Office4)		44	0.10	Result below the MUC of the RPE used. ^{2, 3, 4, 5}
26-46	Occupational Sample on Worker: Wipe-down and cleaning activities (Lab 2)		55	0.05	Result below the MUC of the RPE used. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	28
		Date	Wednesday, 07 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Adjacent to Lab 2 (Main Hall, West End) – Low Risk, Wipe-down and Cleaning activities (Sample 26-47)		
	2. Building 26: Adjacent to Seed Storage (Main Hall, Middle) – Moderate Risk drywall remediation activities (Sample 26-48)		
	3. Building 26: Adjacent to Lab 1 and Bathroom Hallway (Main Hall, East End) – Moderate Risk drywall remediation activities (Sample 26-49)		
	4. Building 26: Lab 2 (West End) – Post Removal, No Activity (Sample 26-50)		
	5. Building 26: Seed Cleaning (West End) – Post Removal, No Activity (Sample 26-51)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Furnace Room, Seed Storage, Office 1&4, Lab 2	Moderate	Contractor continued to suspend High Risk removal activities in West End Containment. Manpower was focused on Moderate-risk drywall & floor tile abatement activities within rooms located adjacent to the Main Hall (i.e. Furnace Room, Office 1, Lab 1 & Seed Storage Rooms).
Building 10	Low	No work was performed by Contractor in Building 10.



Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler collected three (3) ambient air monitoring samples in support of the water damaged drywall remediation activities. Amec Foster Wheeler collected two (2) ambient air monitoring samples in support of re-occupying the Lab 2/Seed Cleaning rooms, post removal activities.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were given on this day

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-47	Ambient: Adjacent to Lab 2 (Main Hall: West End)	Building 26	1577	<0.01	Result below the project requirement. ^{1, 2, 3}
26-48	Ambient: Adjacent to Seed Storage (Main Hall, Middle)		1555	<0.01	Result below the project requirement. ^{1, 2, 3}
26-49	Ambient: Adjacent to Lab 1 & Bathroom Hallway (Main Hall, East End)		1506	<0.01	Result below the project requirement. ^{1, 2, 3}
26-50	Ambient: Lab 2 (Post Abatement Activities)		972	<0.01	Result below the project requirement. ^{1, 2, 3}
26-51	Ambient: Seed Cleaning (Post Abatement Activities)		950	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	29
		Date	Thursday, 08 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Keith Lawson		
Inspector	Keith Lawson		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
	1. Building 26: Clean Room (Main Hall, West End) – High Risk, vacuuming and bag-out abatement activities (Sample 26-52)		
	2. Building 26: Adjacent to Clean Room (Main Hall, West End) – High Risk, vacuuming and bag-out abatement activities (Sample 26-53)		
	3. Building 26: Clean Room (Main Hall, East End) – Moderate Risk, attic abatement activities (Sample 26-54)		
	4. Building 26: Adjacent to Clean Room (Main Hall, East End) – Moderate Risk, attic abatement activities (Sample 26-55)		
	5. Building 26: Occupational Sample (Attic) – Hi-Vol vacuuming of bulk vermiculite (Sample 26-56)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: West and East containments (Attic Space)	Moderate - High	Contractor continued High Risk removal activities in the West End containment and Moderate Risk activities in the East Containment (Attic). Manpower was focused on completing bulk vermiculite abatement activities.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate - High	Amec Foster Wheeler collected four (4) ambient air monitoring samples and one (1) occupational sample, in support of the moderate and high risk vermiculite abatement activities.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were given on this day

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-52	Clean Room: High Risk containment (Main Hall: West End)	Building 26	1583	<0.01	Result below the project requirement. ^{1, 2, 3}
26-53	Adjacent to Clean Room: High Risk Containment (Main Hall, West End)		1515	<0.01	Result below the project requirement. ^{1, 2, 3}
26-54	Clean Room: Moderate Risk containment (Main Hall: East End)		1531	<0.01	Result below the project requirement. ^{1, 2, 3}
26-55	Adjacent to Clean Room: Moderate Risk Containment (Main Hall, East End)		1555	<0.01	Result below the project requirement. ^{1, 2, 3}
26-56	Occupational: Vermiculite abatement activities		65	0.80	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	30
		Date	Friday, 09 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Sample Locations	1. Building 26: West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal (Sample 26-57)		
	2. Building 26: Adjacent to West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal (Sample 26-58)		
	3. Building 26: East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal (Sample 26-59)		
	4. Building 26: Adjacent East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal (Sample 26-60)		
	5. Building 26: Occupational Sample (Attic Work Area) – Moderate Risk, Vermiculite removal (Sample 26-61)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic	Moderate	Contractor continued with moderate risk abatement of vermiculite insulation within the attic. Work activities were downgraded to moderate risk from high risk the previous day when insulation removal activities with the Versa-Vac insulation removal vacuum were completed.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.



Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate	Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite insulation abatement activities. Amec Foster Wheeler collected one (1) occupational air sample from a worker performing insulation removal within the attic work area and performed a visual inspection of worker activities and the work area. Work activities and housekeeping were observed to be satisfactory.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were given on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-57	Ambient: West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal	Building 26	1512	<0.01	Result below the project requirement. ^{1, 2, 3}
26-58	Ambient: Adjacent to West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal		1557	<0.01	Result below the project requirement. ^{1, 2, 3}
26-59	Ambient: East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal		1490	<0.01	Result below the project requirement. ^{1, 2, 3}
26-60	Ambient: Adjacent East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal		1535	<0.01	Result below the project requirement. ^{1, 2, 3}
26-61	Occupational: Attic Work Area – Moderate Risk, Vermiculite removal		52	<0.01	Result below the project requirement. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	31
		Date	Saturday, 10 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Sample Locations	1. Building 26: West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal (Sample 26-62)		
	2. Building 26: Adjacent to West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal (Sample 26-63)		
	3. Building 26: East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal (Sample 26-64)		
	4. Building 26: Adjacent East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal (Sample 26-65)		
	5. Building 26: Occupational Sample (Attic Work Area) – Moderate Risk, Vermiculite removal (Sample 26-66)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic	Moderate	Contractor continued with moderate risk abatement of vermiculite insulation within the attic. Removal of bulk material was completed and the final clean of the work area was begun.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.



Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate	Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite insulation abatement activities. Amec Foster Wheeler collected one (1) occupational air sample from a worker performing insulation removal within the attic work area and performed a visual inspection of worker activities and the work area. Work activities and housekeeping were observed to be satisfactory.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were given on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/ Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-62	Ambient: West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal	Building 26	1527	<0.01	Result below the project requirement. ^{1, 2, 3}
26-63	Ambient: Adjacent to West Clean Room (Main Hall, West End) – Moderate Risk, Vermiculite removal		1566	<0.01	Result below the project requirement. ^{1, 2, 3}
26-64	Ambient: East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal		1544	<0.01	Result below the project requirement. ^{1, 2, 3}
26-65	Ambient: Adjacent East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal		1501	<0.01	Result below the project requirement. ^{1, 2, 3}
26-66	Occupational: Attic Work Area – Moderate Risk, Vermiculite removal		61	<0.01	Result below the project requirement. ^{2, 3, 4, 5}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.


³ Non-fibrous Particulate – LOW.

⁴ Maximum Use Concentration (MUC): The maximum atmospheric concentration of a hazardous substance from which an employee can be expected to be protected when wearing a respirator, and is determined by the assigned protection factor of the respirator or class of respirators and the exposure limit of the hazardous substance. The MUC usually can be determined mathematically by multiplying the assigned protection factor specified for a respirator by the occupational exposure limit (OEL), short term exposure limit, ceiling limit, peak limit, or other exposure limit used for the hazardous substance.

⁵ The RPE utilized was full-facepiece powered air purifying respirator (PAPR), MUC is 100 f/cc.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	32
		Date	Monday, 12 December 2016
Project No.	WX17835PRW	Reviewed and Signed By 	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Sample Locations	1. Building 26: West Clean Room (Main Hall, West End) – High Risk, Vermiculite final clean (Sample 26-67)		
	2. Building 26: Adjacent to West Clean Room (Main Hall, West End) – High Risk, Vermiculite final clean (Sample 26-68)		
	3. Building 26: East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite final clean (Sample 26-69)		
	4. Building 26: Adjacent East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite final clean (Sample 26-70)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Attic	Moderate, High	<p>Contractor completed the final clean for the moderate risk abatement of vermiculite insulation within the attic. During the final visual inspection, minor deficiencies noted by the consultant were promptly corrected by the contractor. Upon passing the final inspection, the contractor applied lockdown glue to the work area surfaces with the intention of allowing it to settle overnight in support of air clearance sampling to be performed the following morning.</p> <p>Contractor completed the final clean of the high risk area located within the Air Drying Room containment on the west side of the Main Hall. Upon passing the final inspection, the contractor applied lockdown glue to the work area surfaces with the intention of allowing it to settle</p>

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		overnight in support of air clearance sampling to be performed the following morning.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Moderate, High	Amec Foster Wheeler collected four (4) ambient air monitoring samples in support of the vermiculite insulation abatement activities. A final visual inspection was performed for the moderate risk attic work area. Minor deficiencies, such as small accumulations of vermiculite and breaches in seals, were observed. These deficiencies were promptly corrected when identified to the contractor personnel during the inspection. Overall, the work performed was satisfactory and when the deficiencies were corrected, the inspection was passed. A final visual inspection was performed for the high risk work area located within the Air Drying Room containment on the west side of the Main Hal. No deficiencies were observed and the inspection was passed.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
1.	During the final visual inspection of the vermiculite abatement within the attic work area, several areas where minor vermiculite buildup was observed. Two contractor workers were present in the containment during the inspection to address such deficiencies and they address the deficiencies as they were identified.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-67	Ambient: West Clean Room (Main Hall, West End) – High Risk, Vermiculite final clean	Building 26	1844	<0.01	Result below the project requirement. ^{1, 2, 3}
26-68	Ambient: Adjacent to West Clean Room (Main Hall, West End) – HighRisk, Vermiculite removal		1744	<0.01	Result below the project requirement. ^{1, 2, 3}
26-69	Ambient: East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal		1744	<0.01	Result below the project requirement. ^{1, 2, 3}
26-70	Ambient: Adjacent East Clean Room (Main Hall, East End) – Moderate Risk, Vermiculite removal		1741	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.


¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	33
		Date	Tuesday, 12 December 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Sample Locations	1. Building 26: Air Clearance, Air Drying Room High Risk Area (Vermiculite Removal) (Sample 26-71)		
	2. Building 26: Air Clearance, Attic Work Area East Side (Vermiculite Removal) (Sample 26-72)		
	3. Building 26: Air Clearance, Attic Work Area Mid Point (Vermiculite Removal) (Sample 26-73)		
	4. Building 26: Air Clearance, Attic Work Area West Side (Vermiculite Removal) (Sample 26-74)		
	5. Building 26: Office 3, Low-Risk VFT and Countertop Removal (Sample 26-75)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: High-Risk Area Office 3 Women's Bathroom	Low	Contractor began low risk teardown of the high-risk vermiculite Versa-Vac area within the air drying room. Three-stage containment was disassembled as well as approximately 75% of the containment structure. Contractor completed low risk vinyl floor tile and countertop removal within Office 3. The work area access was restricted using asbestos work area banner tape and signage on the Lab 3 door, as well as closing the Lab 3 door.

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		Contractor completed low-risk drywall removal within the Women's Washroom. Less than <1 m2 of drywall was removed from the west wall.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Low	Amec Foster Wheeler collected an ambient air sample in support of the low risk vinyl floor tile and countertop removal within Office 3. Amec Foster Wheeler collected four air clearance samples in support of the Attic vermiculite insulation removal. One sample was collected from the high-risk area (Air Drying Room), while the remaining three were collected from the attic. Analysis of the samples determined that fibre concentrations in both areas were less than <0.01 f/cc, and the contractor was given permission to tear down the containment structures and other work area modifications without the use of asbestos PPE.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued to the contractor on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-71	Air Clearance: Air Drying Room High Risk Area (Vermiculite Removal)	Building 26	3402	<0.01	Result below the project requirement. ^{1, 2, 3}
26-72	Air Clearance: Air Clearance, Attic Work Area East Side (Vermiculite Removal)		3018	<0.01	Result below the project requirement. ^{1, 2, 3}
26-73	Air Clearance: Attic Work Area Mid Point (Vermiculite Removal)		3072	<0.01	Result below the project requirement. ^{1, 2, 3}
26-74	Air Clearance: Attic Work Area West Side (Vermiculite Removal)		2874	<0.01	Result below the project requirement. ^{1, 2, 3}
26-75	Ambient: Office 3, Low-Risk VFT and Countertop Removal		543	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.


¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

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HAZARDOUS MATERIAL ABATEMENT QUALITY ASSURANCE MONITORING SITE INSPECTION REPORT

Project Name	Hazardous Building Materials Abatement – Beaverlodge Research Centre	Report No.	34
		Date	Wednesday, 13 December 2016
Project No.	WX17835PRW	Reviewed and Signed By	Patrick Campbell
Prepared By	Stephen Barber		
Inspector	Stephen Barber		
Client	Public Works and Government Services Canada (PWGSC)	Report Issued To	Liana Smith (Environmental Services, PWGSC)
Abatement Contractor	Paragon Remediation Group Ltd. dba ENVIRO-VAC™ (Enviro-Vac)		
Site / Location	Soils Research Building (Building 14), Canola Laboratory (Building 10) and Storage Building (Building 26) / Beaverlodge Research Centre, Beaverlodge, Alberta		
Sample Locations	1. Building 26: Office 3, Low Risk VFT and Countertop Removal (Sample 26-76)		
	2. Building 26: Office 2 and Main Hall, Low Risk Drywall Joint Compound Removal (Sample 26-77)		
	3. Building 26: Threshing Room, Low Risk Transite Panel Removal (Sample 26-78)		

Work Activities (Abatement Contractor):

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
Building 26: Office 3 Office 2 Main Hall Air Drying Room Threshing Room	Low	<p>Contractor completed cleanup of Office 3 work area.</p> <p>Contractor completed low risk drywall removal within Office 2. The removal was performed for less than <1 m² of drywall from the east wall.</p> <p>Contractor completed low risk drywall removal on ceiling and upper walls of Main Hall, in an area adjacent to Office 2. Approximately 3 m² of material was removed.</p> <p>Contractor completed low risk drywall removal on ceiling in the Air Drying Room. Impacted area was located around light fixtures at the southeast corner of the room. Approximately 5 m² of material was removed.</p> <p>Contractor completed low risk transite cement board removal within the Threshing Room. Approximately 5 m² of material was removed from the west wall.</p>

Work Area(s)	Risk Category	Activity (Preparation, Removal, Enclosure, Final Clean, Bag-out, Teardown)
		Note: Drywall removals were performed in order to abate water damaged and mould impacted materials.
Building 10	N.A.	No work was performed by Contractor in Building 10.
Building 14	N.A.	No work was performed by Contractor in Building 14.

Notes: N.A. = Not applicable.

Work Activities (Amec Foster Wheeler):

Work Area(s)	Risk Category	Activity (Milestone Inspection, Air Monitoring, Analysis, Substantial Performance)
Building 26	Low	Amec Foster Wheeler collected an ambient air sample in support of the low risk vinyl floor tile and countertop removal within Office 3. Amec Foster Wheeler collected an ambient air sample in support of the low risk drywall removal within Office 2. The sample was later moved into the Main Hall in support of the drywall removal on the ceiling and upper walls adjacent to Office 2. Amec Foster Wheeler collected an ambient air sample in support of the low risk transite cement board removal within the Threshing Room. Amec Foster Wheeler inspected the drywall, vinyl floor tile, cement countertop and transite cement board removals for completeness and to ensure that proper housekeeping was practiced, including removal of debris.
Building 14	N.A.	No work was performed by Amec Foster Wheeler in Building 14
Building 10	N.A.	No work was performed by Amec Foster Wheeler in Building 10.

Notes: N.A. = Not applicable.

Field Instructions:

Item	Instruction (Three part format: issue, reference, remedy)
N.A.	No instructions were issued to the contractor on this day.

Air Monitoring Results (Asbestos Abatement):

Sample No.	Sample Location/Description	Work Area	Sample Volume (L)	Result (f/cc)	Interpretation
26-76	Ambient: Office 3, Low Risk VFT and Countertop Removal	Building 26	774	<0.01	Result below the project requirement. ^{1, 2, 3}
26-77	Ambient: Office 2 and Main Hall, Low Risk Drywall Joint Compound Removal		646	<0.01	Result below the project requirement. ^{1, 2, 3}
26-78	Ambient: Threshing Room, Low Risk Transite Panel Removal		419	<0.01	Result below the project requirement. ^{1, 2, 3}

Notes:

L = litre; f/cc = fibres per cubic centimetre; < = less than; MUC = maximum use concentration; RPE = respiratory protective equipment.

¹ Project requirement = 0.01 f/cc.

² Underloaded fibres – Underloaded – May Have Positive Bias.

³ Non-fibrous Particulate – LOW.

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APPENDIX C

BUILDING 26 – REMAINING HAZARDOUS MATERIALS

PUBLIC WORKS AND GOVERNMENT
SERVICES CANADA

LEGEND:

Vinyl Asbestos Floor Tiles

Presumed Ozone Depleting Substances

See notes for additional hazardous materials information.



NO.	REVISION	DATE	BY

REMAINING HAZARDOUS MATERIALS

BEAVERLODGE RESEARCH CENTRE
BEAVERLODGE, ALBERTA

#26 STORAGE

SCALE:	NOT TO SCALE	---
DATE:	MARCH 2017	---
DRAWN BY:	MD	---
PROJECT NO.:	WX17835	---



- NOTES:
- GYPSUM BOARD JOINT COMPOUND THROUGHOUT BUILDING CONTAINS ASBESTOS.
 - VERMICULITE MAY REMAIN BETWEEN STRUCTURAL COMPONENTS OR HIDDEN IN VOIDS INCLUDING WALL CAVITIES.
 - LIGHT BALLAST THROUGHOUT BUILDING ARE SUSPECTED TO CONTAIN POLYCHLORINATED BIPHENYLS.
 - FLUORESCENT LIGHT BULBS THROUGHOUT BUILDING CONTAIN MERCURY.
 - SITE FEATURE LOCATIONS ARE APPROXIMATE.
 - BASE DRAWING FROM HAZARDOUS MATERIALS INVESTIGATION REPORT. BALLAST ENVIRONMENTAL CONSULTING LTD. (APRIL 12, 2011 REV. MARCH 2013).