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## APPENDICIES

APPENDIX A	HAZARDOUS BUILDING MATERIALS ASSESSMENT JANUARY 2013
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PART 1 - GENERAL

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| <u>1.1 WORK COVERED BY CONTRACT DOCUMENTS</u> | .1 | Work of this Contract comprises adaptive reuse of the Argo Building, located at the Bedford Institute of Oceanography, Dartmouth, NS.  |
| <u>1.2 WORK BY OTHERS</u>                     | .1 | Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative.  |
| <u>1.3 CONTRACTOR USE OF PREMISES</u>         | .1 | Co-ordinate use of premises under direction of Departmental Representative.  |
| <u>1.4 OWNER OCCUPANCY</u>                    | .1 | Owner will vacate the premises during construction. Owner will need periodic access to the telecommunication room.   |
|   | .2 | Co-operate with Departmental Representative in scheduling operations to minimize conflict and to facilitate Owner usage of telecom room.   |
| <u>1.5 EXISTING SERVICES</u>                  | .1 | Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.  |
|   | .2 | Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian vehicular traffic and tenant operations in other buildings on the site. |
|   | .3 | Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.   |
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1.5 EXISTING  
SERVICES  
(Cont'd)

- .4 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide temporary services to maintain critical building and tenant systems.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures

1.6 DOCUMENTS  
REQUIRED

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Reviewed Shop Drawings.
  - .5 List of Outstanding Shop Drawings.
  - .6 Change Orders.
  - .7 Other Modifications to Contract.
  - .8 Field Test Reports.
  - .9 Copy of Approved Work Schedule.
  - .10 Health and Safety Plan and Other Safety Related Documents.
  - .11 Other documents as specified.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

<u>1.1 RELATED SECTIONS</u>	.1	Section 01 11 00 - Summary of Work.
<u>1.2 ACCESS AND EGRESS</u>	.1	Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.
<u>1.3 USE OF SITE AND FACILITIES</u>	.1	Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
	.2	Maintain existing services to building and provide for personnel and vehicle access.
<u>1.4 EXISTING SERVICES</u>	.1	Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission.
	.2	Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures
<u>1.5 SPECIAL REQUIREMENTS</u>	.1	Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
<u>1.6 SECURITY CLEARANCES</u>	.1	Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

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<u>1.7 BUILDING SMOKING ENVIRONMENT</u>	.1	Comply with smoking restrictions. Smoking is not permitted in the building.
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PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

1.1 RELATED SECTIONS	.1	Section 01 11 00 - Summary of Work.
	.2	Section 01 14 00 - Work Restrictions.
1.2 ADMINISTRATIVE	.1	Departmental Representative will schedule and administer project meetings throughout the progress of the work and record and distribute minutes for review and comment. If no comments are provided to the Departmental Representative within 5 days of receipt, Contractor is assumed to be in agreement and minutes become official record of meeting.
	.2	Provide physical space and make arrangements for meetings.
	.3	Preside at meetings.
	.4	Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.
1.3 PRECONSTRUCTION MEETING	.1	Within 5 days after award of Contract, Departmental Representative will request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
	.2	Departmental Representative, Contractor and major Subcontractors will be in attendance.
	.3	Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
1.4 PROGRESS MEETINGS	.1	During course of Work, Departmental Representative will schedule progress meetings as required. Departmental Representative will record and distribute minutes for review and comment. If no comments are provided to Departmental Representative within 5 days of receipt, Contractor is assumed to be in

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1.4 PROGRESS  
MEETINGS  
(Cont'd)

- .1 (Cont'd)  
agreement and minutes become official record  
of meeting.
- .2 Contractor, major Subcontractors involved in  
Work and Departmental Representative and Owner  
are to be in attendance.
- .3 Agenda to include the following:
  - .1 Review, approval of minutes of previous  
meeting.
  - .2 Review of Work progress since previous  
meeting.
  - .3 Field observations, problems, conflicts.
  - .4 Problems which impede construction  
schedule.
  - .5 Review of off-site fabrication delivery  
schedules.
  - .6 Corrective measures and procedures to  
regain projected schedule.
  - .7 Revision to construction schedule.
  - .8 Progress schedule, during succeeding  
work period.
  - .9 Review submittal schedules: expedite as  
required.
  - .10 Maintenance of quality standards.
  - .11 Review proposed changes for affect on  
construction schedule and on completion date.
  - .12 Other business.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.



PART 1 - GENERAL

1.1 RELATED  
REQUIREMENTS

- .1 Section 01 45 00 - Quality Control.
- .2 Section 01 78 00 - Closeout Submittals.

1.2 ADMINISTRATIVE

- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
  - .2 Do not proceed with Work affected by submittal until review is complete.
  - .3 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
  - .4 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
  - .5 Verify field measurements and affected adjacent Work are co-ordinated.
  - .6 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
  - .7 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
  - .8 Keep one reviewed copy of each submission on site.
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1.3 SHOP DRAWINGS  
AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Nova Scotia, Canada.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.
- .7 Accompany submissions with transmittal letter, in duplicate, containing:
  - .1 Date.
  - .2 Project title and number.
  - .3 Contractor's name and address.
  - .4 Identification and quantity of each shop drawing, product data and sample.
  - .5 Other pertinent data.
- .8 Submissions include:
  - .1 Date and revision dates.
  - .2 Project title and number.
  - .3 Name and address of:
    - .1 Subcontractor.
    - .2 Supplier.

1.3 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .8 Submissions include:(Cont'd)
  - .3 Name and address of:(Cont'd)
    - .3 Manufacturer.
    - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
    - .5 Details of appropriate portions of Work as applicable:
      - .1 Fabrication.
      - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
      - .3 Setting or erection details.
      - .4 Capacities.
      - .5 Performance characteristics.
      - .6 Standards.
      - .7 Operating weight.
      - .8 Wiring diagrams.
      - .9 Single line and schematic diagrams.
      - .10 Relationship to adjacent work.
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
- .12 Submit 1 electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
  - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
  - .2 Testing must have been within 3 years of date of contract award for project.
- .13 Submit electronic copy of certificates for requirements requested in specification

1.3 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .13 (Cont'd)  
Sections and as requested by Departmental Representative.
  - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
  - .2 Certificates must be dated after award of project contract complete with project name.
- .14 Submit electronic copy of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
  - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
- .15 Submit electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
- .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .17 Submit electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .18 Delete information not applicable to project.
- .19 Supplement standard information to provide details applicable to project.
- .20 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.3 SHOP DRAWINGS  
AND PRODUCT DATA  
(Cont'd)

- .21 The review of shop drawings by Public Works and Government Services Canada (PWGSC) is for sole purpose of ascertaining conformance with general concept.
- .1 This review shall not mean that PWGSC approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
- .2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.4 SAMPLES

- .1 Submit for review samples as requested in respective specification Sections. Label samples with origin and intended use.
- .2 Deliver samples prepaid to Departmental Representative's business address site office.
- .3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- .4 Where colour, pattern or texture is criterion, submit full range of samples.
- .5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.
- .7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

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| <u>1.5</u> <u>MOCK-UPS</u>                   | .1 | Erect mock-ups in accordance with 01 45 00 - Quality Control.  |
| <u>1.6</u> <u>PHOTOGRAPHIC DOCUMENTATION</u> | .1 | Submit electronic copy of colour digital photography in jpg format, standard resolution and as directed by Departmental Representative.  |
|  | .2 | Project identification: name and number of project and date of exposure indicated.   |
|  | .3 | Frequency of photographic documentation: weekly or as directed by Departmental Representative and:<br>.1    Upon completion of: demolition, framing and services before concealment of Work, and as directed by Departmental Representative. |

## PART 2 - PRODUCTS

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| <u>2.1</u> <u>NOT USED</u> | .1 | Not Used. |
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## PART 3 - EXECUTION

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| <u>3.1</u> <u>NOT USED</u> | .1 | Not Used. |
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PART 1 - GENERAL

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| <u>1.1 SECTION<br/>INCLUDES</u> | .1 | Health and safety considerations required to ensure that PWGSC shows due diligence towards health and safety on construction sites, and meets the requirements laid out in PWGSC/RPB Departmental Policy DP 073 - Occupational Health and Safety - Construction. |
|---------------------------------|----|--|
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|-----------------------|----|---|
| <u>1.2 REFERENCES</u> | .1 | Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations |
|                       | .2 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)        |
|                       | .1 | Material Safety Data Sheets (MSDS).   |
|                       | .3 | Province of Newfoundland and Labrador   |
|                       | .1 | Occupational Health and Safety Act, R.S.N. 1990.                              |
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| <u>1.3 SUBMITTALS</u> | .1 | Make submittals in accordance with Section 01 33 00 - Submittal Procedures.  |
|                       | .2 | Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:                       |
|                       | .1 | Results of site specific safety hazard assessment.   |
|                       | .2 | Results of safety and health risk or hazard analysis for site tasks and operation.   |
|                       | .3 | Submit electronic copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and or authority having jurisdiction. |
|                       | .4 | Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.   |
|                       | .5 | Submit copies of incident and accident reports.  |
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|------------------------------------|-----|---|
| <u>1.3 SUBMITTALS<br/>(Cont'd)</u> | .6  | Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.  |
|                                    | .7  | Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 7 days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 days after receipt of comments from Departmental Representative. |
|                                    | .8  | Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.   |
|                                    | .9  | Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.                                     |
|                                    | .10 | On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.   |
| <u>1.4 FILING OF<br/>NOTICE</u>    | .1  | File Notice of Project with Provincial authorities prior to beginning of Work.  |
| <u>1.5 SAFETY<br/>ASSESSMENT</u>   | .1  | Perform site specific safety hazard assessment related to project.  |
| <u>1.6 MEETINGS</u>                | .1  | Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.   |
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1.7 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.8 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.9 COMPLIANCE REQUIREMENTS

- .1 Comply with Occupational Health and Safety Act, Occupational Health and Safety Regulations, C. Nova Scotia Reg.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.10 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
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1.11 HEALTH AND  
SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
  - .1 Have site-related working experience specific to activities associated with work.
  - .2 Have working knowledge of occupational safety and health regulations.
  - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
  - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
  - .5 Be on site during execution of Work, report directly to and be under direction of site supervisor.

1.12 POSTING OF  
DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.13 CORRECTION OF  
NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.14 BLASTING

- .1 Blasting or other use of explosives is not permitted.

PART 1 - GENERAL

- 1.1 INSPECTION
- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
  - .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
  - .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
  - .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.
- 1.2 INDEPENDENT INSPECTION AGENCIES
- .1 Unspecified Independent Inspection/Testing Agencies may be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such unspecified services will be borne by Contractor.
  - .2 Provide equipment required for executing inspection and testing by appointed agencies.
  - .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
  - .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to

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|--|----|--|
| <u>1.2 INDEPENDENT INSPECTION AGENCIES</u><br>(Cont'd) | .4 | (Cont'd)<br>Departmental Representative. Pay costs for retesting and reinspection.   |
| <u>1.3 ACCESS TO WORK</u>                              | .1 | Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.   |
|  | .2 | Co-operate to provide reasonable facilities for such access.   |
| <u>1.4 PROCEDURES</u>                                  | .1 | Notify appropriate Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.   |
|  | .2 | Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.  |
|  | .3 | Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.   |
| <u>1.5 REJECTED WORK</u>                               | .1 | Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.   |
|  | .2 | Make good other Contractor's work damaged by such removals or replacements promptly.   |
|  | .3 | If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative. |
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- 1.6 REPORTS .1 Submit electronic copy of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.
- 1.7 TESTS AND MIX DESIGNS .1 Furnish test results and mix designs as requested.
- .2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.
- 1.8 MOCK-UPS .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative as specified in specific Section.
- .3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.
- .6 Remove mock-up at conclusion of Work or when acceptable to Departmental Representative.
- .7 Mock-ups may remain as part of Work.
- .8 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.
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|-----------------------------------|----|--|
| <u>1.9 MILL TESTS</u>             | .1 | Submit mill test certificates as requested required of specification Sections.                     |
| <u>1.10 EQUIPMENT AND SYSTEMS</u> | .1 | Submit adjustment and balancing reports for mechanical, electrical and building equipment systems. |
|                                   | .2 | Refer to Section for definitive requirements.  |

PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
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PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
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PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian General Standards Board (CGSB)
    - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
    - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
  - .2 Canadian Standards Association (CSA International)
    - .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
    - .2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
    - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
    - .4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
  - .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- 1.2 SUBMITTALS
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- 1.3 SCAFFOLDING
- .1 Scaffolding in accordance with CAN/CSA-S269.2.
  - .2 Provide and maintain scaffolding ramps ladders swing staging platforms temporary stairs and lifts.
- 1.4 HOISTING
- .1 Provide, operate and maintain hoists cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
  - .2 Hoists cranes to be operated by qualified operator.
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| <u>1.5 SITE<br/>STORAGE/LOADING</u>                      | .1 | Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.  |
|  | .2 | Do not load or permit to load any part of Work with weight or force that will endanger Work.  |
| <u>1.6 CONSTRUCTION<br/>PARKING</u>                      | .1 | Parking will be permitted on site provided it does not disrupt performance of Work.   |
|  | .2 | Provide and maintain adequate access to project site.   |
| <u>1.7 OFFICES</u>                                       | .1 | Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table. |
|  | .2 | Provide marked and fully stocked first-aid case in a readily available location.  |
|  | .3 | Subcontractors to provide their own offices as necessary. Direct location of these offices.   |
| <u>1.8 EQUIPMENT,<br/>TOOL AND MATERIALS<br/>STORAGE</u> | .1 | Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.                                |
|  | .2 | Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.                            |
| <u>1.9 SANITARY<br/>FACILITIES</u>                       | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances.   |
|  | .2 | Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.  |
|  | .3 | When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary                                   |
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1.9 SANITARY FACILITIES (Cont'd)	.3	(Cont'd) enclosures, inside building. Permanent facilities may be used on approval of Departmental Representative.
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1.10 CLEAN-UP	.1	Remove construction debris, waste materials, packaging material from work site daily.
	.2	Clean dirt or mud tracked onto paved or surfaced roadways.
	.3	Store materials resulting from demolition activities that are salvageable.
	.4	Stack stored new or salvaged material not in construction facilities.

## PART 2 - PRODUCTS

2.1 NOT USED	.1	Not Used.
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PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Canadian General Standards Board (CGSB)
    - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
    - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
  - .2 Canadian Standards Association (CSA International)
    - .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.
  - .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.
- 1.2 INSTALLATION AND REMOVAL
- .1 Provide temporary controls in order to execute Work expeditiously.
  - .2 Remove from site all such work after use.
- 1.3 HOARDING
- .1 Erect temporary site enclosures as directed by the Departmental Representative.
  - .2 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.
- 1.4 GUARD RAILS AND BARRICADES
- .1 Provide secure, rigid guard rails and barricades around open mezzanine, open stair wells.
  - .2 Provide as required by governing authorities.
- 1.5 WEATHER ENCLOSURES
- .1 Provide weather tight temporary closures to unfinished door and window openings, other openings.
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- 1.6 FIRE ROUTES .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
- 1.7 PROTECTION OF BUILDING FINISHES .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
- .4 Be responsible for damage incurred due to lack of or improper protection.
- .5 Protect rooms identified as being retained from dust and impact of demolition work in other areas.
- 1.8 WASTE MANAGEMENT AND DISPOSAL .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Within text of each specifications section, reference may be made to reference standards.
  - .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- 1.2 QUALITY
- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
  - .2 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
  - .3 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
  - .4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- 1.3 AVAILABILITY
- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
  - .2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute

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- 1.3 AVAILABILITY .2 (Cont'd)  
(Cont'd)
- more readily available products of similar character, at no increase in Contract Price or Contract Time.
- 1.4 STORAGE, HANDLING AND PROTECTION .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and steel on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.
- 1.5 TRANSPORTATION .1 Pay costs of transportation of products required in performance of Work.
-

1.6 MANUFACTURER'S  
INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.8 CO-ORDINATION

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

<u>1.9 PROTECTION OF WORK IN PROGRESS</u>	.1	Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.
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<u>1.10 EXISTING UTILITIES</u>	.1	When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.
	.2	Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

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|--------------------------------|-----|--|
| <u>1.1 PROJECT CLEANLINESS</u> | .1  | Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.                         |
|                                | .2  | Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site. |
|                                | .3  | Clear snow and ice from access to building, bank/pile snow in designated areas only.   |
|                                | .4  | Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.   |
|                                | .5  | Provide on-site containers for collection of waste materials and debris.   |
|                                | .6  | Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.                             |
|                                | .7  | Clean interior areas and maintain areas free of dust and other contaminants.   |
|                                | .8  | Store volatile waste in covered metal containers, and remove from premises at end of each working day.   |
|                                | .9  | Provide adequate ventilation during use of volatile or noxious substances.   |
|                                | .10 | Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.                            |
| <u>1.2 FINAL CLEANING</u>      | .1  | When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.          |
|                                | .2  | Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.  |
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|--|----|---|
| <u>1.2 FINAL CLEANING<br/>(Cont'd)</u>           | .3 | Prior to final review remove surplus products, tools, construction machinery and equipment.   |
|  | .4 | Remove waste products and debris including that caused by Owner or other Contractors.   |
|  | .5 | Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.                       |
|  | .6 | Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.                              |
|  | .7 | Sweep and wash clean paved areas.   |
|  | .8 | Remove snow and ice from access to building.  |
| <u>1.3 WASTE<br/>MANAGEMENT AND<br/>DISPOSAL</u> | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal. |

## PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
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## PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 1 - GENERAL

1.1 WASTE  
MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's Waste Management Plan and Goals.
- .2 PWGSC's Waste Management Goal 50 percent of total Project Waste to be diverted from landfill sites. Provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced. Include for sites that recycle construction materials.
- .3 Accomplish maximum control of solid construction waste.
- .4 Preserve environment and prevent pollution and environment damage.

1.2 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
  - .2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
  - .3 Inert Fill: inert waste - exclusively asphalt and concrete.
  - .4 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
  - .5 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
  - .6 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
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1.2 DEFINITIONS  
(Cont'd)

- .7 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .8 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
  - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
  - .2 Returning reusable items including pallets or unused products to vendors.
- .9 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .10 Separate Condition: refers to waste sorted into individual types.
- .11 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .12 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.
- .13 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .14 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

- 1.3 DOCUMENTS .1 Maintain at job site, one copy of following documents:
- .1 Waste Reduction Workplan.
  - .2 Material Source Separation Plan.
- 1.4 SUBMITTALS .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
- .1 Submit 2 copies of completed Waste Audit (WA): Schedule A.
  - .2 Submit 2 copies of completed Waste Reduction Workplan (WRW): Schedule B.
  - .3 Submit 2 copies of completed Demolition Waste Audit (DWA): Schedule C.
  - .4 Submit 2 copies of Materials Source Separation Program (MSSP) description.
- .3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
- .1 Failure to submit could result in hold back of final payment.
  - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
  - .3 For each material reused, sold or recycled from project, include amount in tonnes quantities by number, type and size of items and the destination.
  - .4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.
- 1.5 WASTE REDUCTION WORKPLAN (WRW) .1 Prepare WRW prior to project start-up.
- .2 WRW should include but not limited to:
- .1 Destination of materials listed.
  - .2 Deconstruction/disassembly techniques and sequencing.
  - .3 Schedule for deconstruction/disassembly.
  - .4 Location.
  - .5 Security.
  - .6 Protection.
-

- 1.5 WASTE REDUCTION .2 (Cont'd)  
WORKPLAN (WRW)  
(Cont'd)
- .7 Clear labelling of storage areas.
  - .8 Details on materials handling and removal procedures.
  - .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.
  - .3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
  - .4 Describe management of waste.
  - .5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.
  - .6 Post WRW or summary where workers at site are able to review content.
  - .7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.
  - .8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.
- 1.6 MATERIALS .1 Prepare MSSP and have ready for use prior to  
SOURCE SEPARATION project start-up.  
PROGRAM (MSSP)
- .2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Departmental Representative.
  - .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
  - .4 Provide containers to deposit reusable and recyclable materials.
  - .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
  - .6 Locate separated materials in areas which minimize material damage.
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1.6 MATERIALS  
SOURCE SEPARATION  
PROGRAM (MSSP)  
(Cont'd)

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- .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
  - .1 Transport to approved and authorized recycling facility.
- .8 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.
  - .1 Ship materials to site operating under Certificate of Approval premises of Owner or as directed by Departmental Representative.
  - .2 Materials must be immediately separated into required categories for reuse or recycling.

1.7 STORAGE,  
HANDLING AND  
PROTECTION

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- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
  - .2 Unless specified otherwise, materials for removal become Contractor's property.
  - .3 Protect, stockpile, store and catalogue salvaged items.
  - .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
  - .5 Protect structural components not removed for demolition from movement or damage.
  - .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
  - .7 Protect surface drainage, mechanical and electrical from damage and blockage.
  - .8 Separate and store materials produced during dismantling of structures in designated areas.
  - .9 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
    - .1 On-site source separation is recommended.
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| <u>1.7 STORAGE,<br/>HANDLING AND<br/>PROTECTION<br/>(Cont'd)</u> | .9 | (Cont'd)<br>.2 Remove co-mingled materials to off-site processing facility for separation.<br>.3 Provide waybills for separated materials.   |
| <u>1.8 DISPOSAL OF<br/>WASTES</u>                                | .1 | Do not bury rubbish or waste materials.  |
|  | .2 | Do not dispose of waste volatile materials mineral spirits oil paint thinner into waterways, storm, or sanitary sewers.  |
|  | .3 | Keep records of construction waste including:<br>.1 Number and size of bins.<br>.2 Waste type of each bin.<br>.3 Total tonnage generated.<br>.4 Tonnage reused or recycled.<br>.5 Reused or recycled waste destination.<br>.6. |
|  | .4 | Remove materials from deconstruction as deconstruction/disassembly Work progresses.  |
|  | .5 | Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.   |
| <u>1.9 USE OF SITE<br/>AND FACILITIES</u>                        | .1 | Execute work with least possible interference or disturbance to normal use of premises.  |
|  | .2 | Maintain security measures established by existing facility, approved by Departmental Representative.  |
| <u>1.10 SCHEDULING</u>   | .1 | Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.  |
-

## PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

## PART 3 - EXECUTION

3.1 SELECTIVE DEMOLITION .1 Reuse of Building Elements: this project has been designed to result in end of project rates for reuse of building elements as follows: do not demolish building elements beyond what is indicated on Drawings without approval by Departmental Representative's.

3.2 APPLICATION .1 Do Work in compliance with WRW.  
 .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.3 CLEANING .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.  
 .2 Clean-up work area as work progresses.  
 .3 Source separate materials to be reused/recycled into specified sort areas.

3.4 WASTE REDUCTION WORKPLAN (WRW) .1 Schedule B:

(1) Material Category	(2) Person(s) Responsible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material(s) Destination
<hr/>							

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Wood  
Plastics  
Pallets  
Plastic  
Packag  
ing  
Card-  
board  
Packag  
ing  
Doors  
and  
Windows  
Painted  
Frames  
Glass  
Metal  
Other

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PART 1 - GENERAL

- 1.1 REFERENCES .1 Canadian Environmental Protection Act (CEPA)  
.1 SOR/2008-197, Storage Tank Systems for  
Petroleum Products and Allied Petroleum  
Products Regulations.
- 1.2 ADMINISTRATIVE REQUIREMENTS .1 Acceptance of Work Procedures:  
.1 Contractor's Inspection: Contractor:  
conduct inspection of Work, identify  
deficiencies and defects, and repair as  
required to conform to Contract Documents.  
.1 Notify Departmental Representative  
in writing of satisfactory completion of  
Contractor's inspection and submit  
verification that corrections have been  
made.  
.2 Request Departmental Representative  
inspection.  
.2 Departmental Representative Inspection:  
.1 Departmental Representative and  
Contractor to inspect Work and identify  
defects and deficiencies.  
.2 Contractor to correct Work as  
directed.  
.3 Completion Tasks: submit written  
certificates in English that tasks have been  
performed as follows:  
.1 Work: completed and inspected for  
compliance with Contract Documents.  
.2 Defects: corrected and deficiencies  
completed.  
.4 Final Inspection:  
.1 When completion tasks are done,  
request final inspection of Work by  
Departmental Representative, Owner and  
Contractor.  
.2 When Work incomplete according to  
Owner and Departmental Representative,  
complete outstanding items and request  
re-inspection.
- 1.3 FINAL CLEANING .1 Clean in accordance with Section 01 74 11 -  
Cleaning.  
.1 Remove surplus materials, excess  
materials, rubbish, tools and equipment.

1.3 FINAL CLEANING (Cont'd)	.2	Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21.
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PART 2 - PRODUCTS

2.1 NOT USED	.1	Not Used.
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PART 3 - EXECUTION

3.1 NOT USED	.1	Not Used.
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PART 1 - GENERAL

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|---|----|--|
| <u>1.1 AS-BUILT<br/>DOCUMENTS AND<br/>SAMPLES</u> | .1 | Keep record documents and samples available for inspection by Departmental Representative. |
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- |   |    |   |
|---|----|---|
| <u>1.2 DELIVERY,<br/>STORAGE AND<br/>HANDLING</u> | .1 | Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration. |
|   | .2 | Store in original and undamaged condition with manufacturer's seal and labels intact.                     |
|   | .3 | Store components subject to damage from weather in weatherproof enclosures.                               |
|   | .4 | Store paints and freezable materials in a heated and ventilated room.                                     |
|   | .5 | Remove and replace damaged products at own expense and for review by Departmental Representative.         |

PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 3 - EXECUTION

- |                     |    |           |
|---------------------|----|-----------|
| <u>3.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 02 81 01 - Hazardous Materials.
- .4 Section 01 56 00 - Temporary Barriers and Enclosures.
- .5 Section 01 35 29.06 - Health and Safety Requirements.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International).
  - .1 CSA S350-M1980(R1998), Code of Practice for Safety in Demolition of Structures.
- .2 Department of Justice Canada (Jus).
  - .1 Canadian Environmental Assessment Act (CEAA), most recent.
  - .2 Transportation of Dangerous Goods Act (TDGA), most recent.

1.3 DEFINITIONS

- .1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.
  - .2 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating related, required submittal and reporting requirements.
  - .3 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
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1.3 DEFINITIONS  
(Cont'd)

- .3 Waste Audit (WA):(Cont'd)  
Indicates quantities of reuse, recycling and landfill.
- .4 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 The WMC is responsible for fulfilment of reporting requirements.
- .3 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate:
  - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
  - .2 Schedule of selective demolition.
  - .3 Number and location of dumpsters.
  - .4 Anticipated frequency of tippage.
  - .5 Name and address of haulers and waste facilities.
- .4 Submit copies of certified bills of lading and receipts from authorized disposal sites and reuse and recycling facilities for material removed from site on a weekly basis and upon request of Departmental Representative.
  - .1 Written authorization from Departmental Representative is required to deviate from haulers and waste facilities listed in Waste Reduction Workplan.
- .5 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures and underpinning.
- .6 Submit drawings stamped and signed by qualified professional engineer registered or licensed in Province of Newfoundland and Labrador, Canada.

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|--|----|--|
| <u>1.5 QUALITY ASSURANCE</u>             | .1 | Regulatory Requirements: Ensure Work is performed in compliance with CEAA, TDGA, and applicable Provincial and Municipal regulations.  |
|  | .2 | Meetings: <ul style="list-style-type: none"><li>.1 Hold project meetings every 2 weeks.</li><li>.2 Ensure key personnel attend.</li><li>.3 WMC must provide written report on status of waste diversion activity at each meeting.</li></ul>  |
| <u>1.6 WASTE MANAGEMENT AND DISPOSAL</u> | .1 | Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.  |
|  | .2 | Divert excess materials from landfill to site approved by Departmental Representative.   |
| <u>1.7 ENVIRONMENTAL PROTECTION</u>      | .1 | Ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.  |
|  | .2 | Fires and burning of waste or materials is not permitted on site.  |
|  | .3 | Do not bury rubbish waste materials.   |
|  | .4 | Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. <ul style="list-style-type: none"><li>.1 Ensure proper disposal procedures are maintained throughout project.</li></ul> |
|  | .5 | Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.   |
|  | .6 | Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.   |
-

1.7 ENVIRONMENTAL  
PROTECTION  
(Cont'd)

- .7 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.8 EXISTING  
CONDITIONS

- .1 Removal of hazardous materials is part of the work.
- .2 Should material resembling spray or trowel applied asbestos or other designated substance be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.
- .3 List items to be salvaged for reuse:
  - .1 Doors and Frames.
  - .2 Ceiling tile.
  - .3 Tracks & Blinds.
  - .4 Wood & Glass partitions.
  - .5 Tagged light fixtures.
  - .6 Tagged equipment.
  - .7 Tagged mill work.
- .4 Structures to be demolished to be based on their condition on date that tender is accepted.
  - .1 Remove, protect and store salvaged items as directed by Departmental Representative. Salvage items for return to owner as identified by Departmental Representative. Deliver to Departmental Representative as directed.

1.9 SCHEDULING

- .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
  - .1 In event of unforeseen delay notify Departmental Representative in writing.



## PART 2 - PRODUCTS

- |                      |    |  |
|----------------------|----|--|
| <u>2.1 EQUIPMENT</u> | .1 | Leave machinery running only while in use. |
|----------------------|----|--|

## PART 3 - EXECUTION

- |                        |    |  |
|------------------------|----|--|
| <u>3.1 PROTECTION</u>  | .1 | Prevent movement, settlement or damage of adjacent structures, services, and parts of existing building to remain.<br>.1 Provide bracing and shoring as required.<br>.2 Repair damage caused by demolition as directed by Departmental Representative. |
|                        | .2 | Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.                        |
|                        | .3 | Prevent debris from blocking surface drainage system, and mechanical and electrical systems which must remain in operation.  |
| <u>3.2 PREPARATION</u> | .1 | Do Work in accordance with Section 0. 35 29.06 - Health and Safety Requirements  |
|                        | .2 | Disconnect and cap designated mechanical services.   |
|                        | .3 | Do not disrupt active or energized utilities designated to remain undisturbed.   |
| <u>3.3 SAFETY CODE</u> | .1 | Do demolition work in accordance with Section 01 56 00 - Temporary Barriers and Enclosures   |
|                        | .2 | Blasting operations not permitted during demolition.   |
-

3.4 REMOVAL OF  
HAZARDOUS WASTES

- .1 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.
- .2 Prior to start of demolition work remove contaminated or hazardous materials from site and dispose of at designated disposal facilities in safe manner and in accordance with TDGA and other applicable requirements and Section 02 81 01 - Hazardous Materials.

3.5 PARTIAL  
DEMOLITION OF  
STRUCTURES

- .1 Do not demolish load bearing structures.

3.6 DEMOLITION

- .1 Demolish parts of structure.
  - .2 To permit future construction.
  - .3 At end of each day's work, leave Work in safe and stable condition.
    - .1 Protect interiors of parts not to be demolished from exterior elements at all times.
    - .2 Ensure fire alarm system is in good working order.
  - .4 Demolish to minimize dusting.
  - .5 Contain fibrous materials (e.g. Insulation) to minimize release of airborne fibres while being transported within facility.
  - .6 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.
  - .7 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.
-

3.7 STOCKPILING

- .1 Label stockpiles, indicating material type and quantity.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials convenient for use in new construction. Eliminate double handling wherever possible.
- .4 Separate from general waste stream each of following materials. Stockpile materials in neat and orderly fashion in location and as directed by Departmental Representative for alternate disposal. Stockpile materials in accordance with applicable fire and safety regulations.
  - .1 Glass fibre ceiling tiles.
  - .2 Wiring and conduit.
  - .3 Outlets/switches.
  - .4 Floor receptacles.
  - .5 Metal duct work, baffles, HVAC equipment.
  - .6 Insulation batts.
  - .7 Miscellaneous metals.
- .5 Supply separate, clearly marked disposal bins for categories of waste material.
- .6 Stockpile on site insulation Batts, steel studs and clips in good condition for reuse in new construction.

3.8 REMOVAL FROM  
SITE

- .1 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project construction.
- .2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .3 Transport material designated for alternate disposal using approved haulers and waste facilities listed in Waste Reduction Workplan and in accordance with applicable regulations.
  - .1 Written authorization from Departmental Representative is required to deviate from haulers and waste facilities listed in Waste Reduction Workplan.

3.8 REMOVAL FROM .4  
SITE  
(Cont'd)

Dispose of materials not designated for alternate disposal in accordance with applicable regulations.  
.1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.  
.2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS .1 Structure Demolition Section 02 41 16.

1.2 REFERENCES .1 Definitions:  
.1 Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.  
.2 Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.  
.3 Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.  
.2 Reference Standards:  
.1 Canadian Environmental Protection Act, 1999 (CEPA 1999)  
.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).  
.2 Department of Justice Canada (Jus)  
.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).  
.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).  
.3 Green Seal Environmental Standards (GS)  
.1 GS-11-2008, 2nd Edition, Paints and Coatings.  
.2 GS-36-00, Commercial Adhesives.  
.4 Health Canada / Workplace Hazardous Materials Information System (WHMIS)  
.1 Material Safety Data Sheets (MSDS).  
.5 National Research Council Canada Institute for Research in Construction (NRC-IRC)  
.1 National Fire Code of Canada-2005.

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1.3 ACTION AND  
INFORMATIONAL  
SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.
  - .3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.
- .3 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

1.4 DELIVERY,  
STORAGE AND  
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .4 Storage and Handling Requirements:
  - .1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.
  - .2 Store and handle hazardous materials and wastes in accordance with applicable federal

1.4 DELIVERY,  
STORAGE AND  
HANDLING  
(Cont'd)

- .4 Storage and Handling Requirements:(Cont'd)
- .2 (Cont'd)  
and provincial laws, regulations, codes, and  
guidelines.
- .3 Store and handle flammable and  
combustible materials in accordance with  
National Fire Code of Canada requirements.
- .4 Keep no more than 45 litres of flammable  
and combustible liquids such as gasoline,  
kerosene and naphtha for ready use.
- .1 Store flammable and combustible  
liquids in approved safety cans bearing  
the Underwriters' Laboratory of Canada or  
Factory Mutual seal of approval.
- .2 Storage of quantities of flammable  
and combustible liquids exceeding 45  
litres for work purposes requires the  
written approval of the Departmental  
Representative.
- .5 Transfer of flammable and combustible  
liquids is prohibited within buildings.
- .6 Transfer flammable and combustible  
liquids away from open flames or  
heat-producing devices.
- .7 Solvents or cleaning agents must be  
non-flammable or have flash point above 38  
degrees C.
- .8 Store flammable and combustible waste  
liquids for disposal in approved containers  
located in safe, ventilated area. Keep  
quantities to minimum.
- .9 Observe smoking regulations, smoking is  
prohibited in areas where hazardous materials  
are stored, used, or handled.
- .10 Storage requirements for quantities of  
hazardous materials and wastes in excess of 5  
kg for solids, and 5 litres for liquids:
- .1 Store hazardous materials and  
wastes in closed and sealed containers.
- .2 Label containers of hazardous  
materials and wastes in accordance with  
WHMIS.
- .3 Store hazardous materials and  
wastes in containers compatible with that  
material or waste.
- .4 Segregate incompatible materials  
and wastes.
- .5 Ensure that different hazardous  
materials or hazardous wastes are stored  
in separate containers.
- .6 Store hazardous materials and  
wastes in secure storage area with  
controlled access.

1.4 DELIVERY,  
STORAGE AND  
HANDLING  
(Cont'd)

- .4 Storage and Handling Requirements:(Cont'd)
- .10 (Cont'd)
- .7 Maintain clear egress from storage area.
- .8 Store hazardous materials and wastes in location that will prevent them from spilling into environment.
- .9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- .10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- .11 When hazardous waste is generated on site:
- .1 Co-ordinate transportation and disposal with Departmental Representative.
- .2 Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
- .3 Use licensed carrier authorized by provincial authorities to accept subject material.
- .4 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
- .5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
- .6 Only trained personnel handle, offer for transport, or transport dangerous goods.
- .7 Provide photocopy of shipping documents and waste manifests to Departmental Representative.
- .8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.
- .9 Report discharge, emission, or escape of hazardous materials immediately to Departmental Representative and appropriate provincial authority. Take



- 1.4 DELIVERY, STORAGE AND HANDLING (Cont'd)
- .4 Storage and Handling Requirements:(Cont'd)
- .10 (Cont'd)
- .11 (Cont'd)
- .9 (Cont'd)
- reasonable measures to control release.
- .12 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- .13 Report spills or accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

## PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Description:
- .1 Bring on site only quantities hazardous material required to perform Work.
- .2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

## PART 3 - EXECUTION

- 3.1 CLEANING
- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and:
- .1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

3.1 CLEANING  
(Cont'd)

- .3 Waste Management:(Cont'd)
- .2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.
  - .3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
  - .4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
  - .5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
  - .6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
  - .7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
  - .8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
    - .1 Hazardous wastes recycled in manner constituting disposal.
    - .2 Hazardous waste burned for energy recovery.
    - .3 Lead-acid battery recycling.
    - .4 Hazardous wastes with economically recoverable precious metals.

## PART 1 - GENERAL

- 1.1 SUMMARY .1 Comply with requirements of this Section when performing following Work:
- .1 Removal or disturbance as specified of more than one square metre of friable asbestos containing material during the repair, alteration, maintenance or demolition of a building or any machinery or equipment located as indicated at site.
  - .2 The spray application of a sealant to friable asbestos containing material.
  - .3 Cleaning or removing air handling equipment, including rigid ducting but not including filters, in a building that has asbestos containing sprayed fireproofing.
  - .4 Repairing, altering or demolishing all or part of a kiln, metallurgical furnace or similar structure that is made in part of refractory materials that are asbestos containing materials.
  - .5 Breaking, cutting, drilling, abrading, grinding, sanding or vibrating non-friable asbestos containing material, if the work is done by means of power tools that are not attached to dust-collecting devices equipped with HEPA filters.
  - .6 Repairing, altering or demolishing all or part of any building in which asbestos is or was used in the manufacture of products.
- 1.2 RELATED REQUIREMENTS .1 Requirements and procedures for asbestos abatement of asbestos containing materials of the type described within.
- .2 N.B. The work may be able to be completed without disturbing asbestos-containing materials. If they do have to be disturbed, the requirements of this section come into force.
- 1.3 REFERENCES .1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.205-94, Sealer for Application to Asbestos-Fibre-Releasing Materials.

1.3 REFERENCES  
(Cont'd)

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- .2 Canadian Standards Association (CSA International)
- .3 Department of Justice Canada
  - .1 Canadian Environmental Protection Act (CEPA), 1999.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 Underwriters' Laboratories of Canada (ULC)
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention (CDC)/National Institute for Occupational Safety and Health (NIOSH)
  - .1 NIOSH 94-113-August 1994, NIOSH Manual of Analytical Methods (NMAM), 4th Edition.
- .8 U.S. Department of Labour - Occupational Safety and Health Administration - Toxic and Hazardous Substances
  - .1 29 CFR 1910.1001-2001, Asbestos Regulations.

1.4 DEFINITIONS

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- .1 Airlock: system for permitting ingress or egress without permitting air movement between contaminated area and uncontaminated area, typically consisting of two curtained doorways at least 2 m apart.
  - .2 Amended Water: water with a non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
  - .3 Asbestos Containing Materials (ACMs): materials that contain 0.5 0.1 provincial regulated amount per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
  - .4 Asbestos Work Areas: area where work takes place which will, or may disturb ACMs.
-

1.4 DEFINITIONS  
(Cont'd)

- .5 Authorized Visitors: Departmental Representatives or designated representatives, and representatives of regulatory agencies.
- .6 Competent worker person: in relation to specific work, means a worker who:
  - .1 Is qualified because of knowledge, training and experience to perform the work.
  - .2 Is familiar with the provincial federal laws and with the provisions of the regulations that apply to the work.
  - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
  - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
  - .2 Reinforce free edges of polyethylene with duct tape and weight bottom edge to ensure proper closing.
  - .3 Overlap each polyethylene sheet at openings not less than 1.5 m on each side.
- .8 DOP Test: testing method used to determine integrity of Negative Pressure unit using dioctyl phthalate (DOP) HEPA-filter leak test.
- .9 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .10 Glove Bag: prefabricated glove bag as follows:
  - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
  - .2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
  - .3 Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.
  - .4 Straps for sealing ends around pipe.

1.4 DEFINITIONS  
(Cont'd)

- .11 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .12 Negative pressure: system that extracts air directly from work area, filters such extracted air through High Efficiency Particulate Air filtering system, and discharges this air directly outside work area to exterior of building.
  - .1 System to maintain minimum pressure differential of 5 Pa relative to adjacent areas outside of work areas, be equipped with alarm to warn of system breakdown, and be equipped with instrument to continuously monitor and automatically record pressure differences.
- .13 Non-Friable Materials: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .14 Occupied Areas: any area of building or work site that is outside Asbestos Work Area.
- .15 Polyethylene sheeting sealed with tape: polyethylene sheeting of type and thickness specified sealed with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide continuous polyethylene membrane to protect underlying surfaces from water damage or damage by sealants, and to prevent escape of asbestos fibres through sheeting into clean area.
- .16 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

1.5 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Before beginning work:
  - .1 Obtain from appropriate agency and submit to Departmental Representative necessary permits for transportation and disposal of asbestos waste. Ensure that dump operator is fully aware of hazardous nature of

1.5 SUBMITTALS  
(Cont'd)

- .2 Before beginning work:(Cont'd)
- .1 (Cont'd)
- material being dumped, and proper methods of disposal. Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to receive and properly dispose of asbestos waste.
- .2 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person on hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing. Submit proof of attendance in form of certificate.
- .3 Ensure supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative. Submit proof of attendance in form of certificate. Minimum of one Supervisor for every ten workers.
- .4 Submit layout of proposed enclosures and decontamination facilities to Departmental Representative for review.
- .5 Submit documentation including test results for sealer proposed for use.
- .6 Submit Provincial/Territorial and/or local requirements for Notice of Project form.
- .7 Submit proof of Contractor's Asbestos Liability Insurance.
- .8 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.
- .9 Submit Worker's Compensation Board status and transcription of insurance.
- .10 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including but not limited to following:
- .1 Encapsulants.
- .2 Amended water.
- .3 Slow drying sealer.

1.6 QUALITY  
ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
  - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
  - .2 Safety Requirements: worker and visitor protection.
    - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area includes:
      - .1 Air purifying full face-mask respirator Powered air purifying respirator (PAPR) Supplied air respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is



1.6 QUALITY  
ASSURANCE  
(Cont'd)

.2 Health and Safety:(Cont'd)  
.2 Safety Requirements:(Cont'd)  
.1 (Cont'd)

physically able to perform the operation while using the respirator.

.2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.

Requirements for each worker:

.1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters that have been tested as satisfactory, clean coveralls and head covers before entering Equipment and Access Rooms or Asbestos Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.

.2 Remove gross contamination from clothing before leaving work area then proceed to Equipment and Access Room and remove clothing except respirators. Place contaminated work suits in receptacles for disposal with other asbestos - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. Still wearing the respirator proceed naked to showers. Using soap and water wash body and hair thoroughly. Clean outside of respirator

1.6 QUALITY  
ASSURANCE  
(Cont'd)

.2 Health and Safety:(Cont'd)  
.2 Safety Requirements:(Cont'd)  
.1 (Cont'd)

with soap and water while showering; remove respirator; remove filters and wet them and dispose of filters in container provided for purpose; and wash and rinse inside of respirator. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of asbestos abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

.3 After showering and drying off, proceed to clean change room and dress in street clothes at end of each day's work, or in clean coveralls before eating, smoking, or drinking. If re-entering work area, follow procedures outlined in paragraphs above.

.4 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers must not use this system as means to leave or enter work area.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual asbestos abatement.

.4 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.5 Ensure that no person required to enter an Asbestos Work Area has facial

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1.6 QUALITY  
ASSURANCE  
(Cont'd)

- .2 Health and Safety:(Cont'd)
  - .2 Safety Requirements:(Cont'd)
    - .5 (Cont'd)  
hair that affects seal between respirator  
and face.
    - .6 Visitor Protection:
      - .1 Provide protective clothing  
and approved respirators to  
Authorized Visitors to work areas.
      - .2 Instruct Authorized Visitors  
in the use of protective clothing,  
respirators and procedures.
      - .3 Instruct Authorized Visitors  
in proper procedures to be followed  
in entering into and exiting from  
Asbestos Work Area.

1.7 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate waste materials for reuse and  
recycling in accordance with Section 01 74 21  
- Construction/Demolition Waste Management and  
Disposal.
- .2 Remove from site and dispose of packaging  
materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper  
plastic polystyrene corrugated cardboard  
packaging material in appropriate on-site bins  
for recycling in accordance with Waste  
Management Plan.
- .4 Separate for reuse and recycling and place in  
designated containers steel metal plastic  
waste in accordance with Waste Management  
Plan.
- .5 Place materials defined as hazardous or toxic  
in designated containers.
- .6 Handle and dispose of hazardous materials in  
accordance with the CEPA, TDGA, Regional and  
Municipal regulations.
- .7 Fold up metal banding, flatten and place in  
designated area for recycling.
- .8 Disposal of asbestos waste generated by  
removal activities must comply with Federal,  
Provincial, Territorial and Municipal  
regulations. Dispose of asbestos waste in  
sealed double thickness 6 ml bags or leak

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1.7 WASTE  
MANAGEMENT AND  
DISPOSAL  
(Cont'd)

- .8 (Cont'd)  
proof drums. Label containers with appropriate  
warning labels.
- .9 Provide manifests describing and listing  
waste created. Transport containers by  
approved means to licenced landfill for  
burial.

1.8 EXISTING  
CONDITIONS

- .1 Results of tests of asbestos containing  
materials to be handled, removed, or otherwise  
disturbed and disposed of during this Project  
are available for inspection at bound into  
this specification at end of this Section.  
These are for general information only and are  
not necessarily representative of asbestos  
containing materials covered within scope of  
this Project.
- .2 Notify Departmental Representative of suspect  
asbestos containing material discovered during  
Work and not apparent from drawings,  
specifications, or report pertaining to Work.  
Do not disturb such material until instructed  
by Departmental Representative.

1.9 PERSONNEL  
TRAINING

- .1 Before beginning Work, provide to  
Departmental Representative satisfactory proof  
that every worker has had instruction and  
training in hazards of asbestos exposure, in  
personal hygiene including dress and showers,  
in entry and exit from Asbestos Work Area, in  
aspects of work procedures including glove bag  
procedures, and in use, cleaning, and disposal  
of respirators and protective clothing.
- .2 Instruction and training related to  
respirators includes, at minimum:
  - .1 Proper fitting of equipment.
  - .2 Inspection and maintenance of equipment.
  - .3 Disinfecting of equipment.
  - .4 Limitations of equipment.
- .3 Instruction and training must be provided by  
competent, qualified person.
- .4 Supervisory personnel to complete required  
training.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- .1 Polyethylene: minimum 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: minimum 0.15 mm thick, woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.
- .4 Wetting agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether, or other material approved by Departmental Representative, mixed with water in concentration to provide adequate penetration and wetting of asbestos containing material.
- .5 Waste Containers: contain waste in two separate containers.
  - .1 Inner container: 0.15 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.
  - .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
  - .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official languages, that is visible when ready for removal to disposal site. Label containers in accordance with Asbestos Regulations 29 CFR 1910.1001. Label in both official languages.
- .6 Glove bag:
  - .1 Acceptable materials: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.
  - .2 The glove bag to be equipped with:
    - .1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period.

2.1 MATERIALS  
(Cont'd)

- .6 Glove bag:(Cont'd)
  - .2 (Cont'd)
    - .2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure.
    - .3 A tool pouch with a drain.
    - .4 A seamless bottom and a means of sealing off the lower portion of the bag.
    - .5 A high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
- .7 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .8 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .9 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.
- .10 Encapsulants: Type 2 surface film forming Type 1 penetrating type Class A water based conforming to CAN/CGSB-1.205 and approved by the Fire Commissioner of Canada having following characteristics:
- .11 Sprayed fireproofing: ULC labelled and listed asbestos-free cementitious mineral fibre to provide degree of fire or thermal protection required in accordance with Section 07 84 00 - Fire Stopping.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .2 Work Areas:
  - .1 Preclean fixed casework, plant, and equipment within proposed work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
  - .2 Clean proposed work areas using, where practicable, HEPA vacuum cleaning equipment. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum equipment.
  - .3 The spread of dust from the work area to be prevented by:
    - .1 Using enclosures of polyethylene or other suitable material that is impervious to asbestos (including, if the enclosure material is opaque, one or more transparent window areas to allow observation of the entire work area from outside the enclosure), if the work area is not enclosed by walls.
    - .2 Using curtains of polyethylene sheeting or other suitable material that is impervious to asbestos, fitted on each side of each entrance or exit from the work area.
  - .4 Put negative pressure system in operation and operate continuously from time first polyethylene is installed to seal openings until final completion of work including final cleanup. Provide continuous monitoring of pressure difference using automatic recording instrument. The system to maintain a negative air pressure of 0.02 inches 5 Pa of water, relative to the area outside the enclosed area. The system to be inspected and maintained by a competent person prior each use to ensure that there is no air leakage, and if the filter is found to be damaged or defective, it to be replaced before the ventilation system is used.
  - .5 Seal off openings such as corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.

3.1 PREPARATION  
(Cont'd)

.2

Work Areas:(Cont'd)

.6 Cover floor and wall surfaces with polyethylene sheeting sealed with tape. Use one two layer s of FR polyethylene on floors. Cover floors first so that polyethylene extends at least 300 mm up walls then cover walls to overlap floor sheeting.

.7 Build airlocks at entrances to and exits from work areas so that work areas are always closed off by one curtained doorway when workers enter or exit.

.8 At each access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used: "CAUTION ASBESTOS HAZARD AREA (25 mm) NO UNAUTHORIZED ENTRY (19 mm) WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)".

.9 After work area isolation, remove heating, ventilating, and air conditioning filters, pack in sealed plastic bags 0.15 mm minimum thick and treat as contaminated asbestos waste. Remove ceiling - mounted objects such as lights, partitions, other fixtures not previously sealed off, and other objects that interfere with asbestos removal, as directed by Departmental Representative. Use localized water spraying during fixture removal to reduce fibre dispersal.

.10 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.

.11 Where application of water is required for wetting asbestos containing materials, shut off electrical power, provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.

.12 After preparation of work areas and Decontamination Enclosure Systems, remove contaminated materials and dispose of as contaminated waste in specified containers. Spray asbestos debris and immediate work area with amended water to reduce dust, as work progresses.

.13 After preparation of work areas and Decontamination Enclosure Systems, for the removal of all other asbestos containing materials, remove within work area and dispose



3.1 PREPARATION  
(Cont'd)

- .2 Work Areas:(Cont'd)
  - .13 (Cont'd)  
of as contaminated waste in specified  
containers. Spray asbestos debris and  
immediate work area with amended water to  
reduce dust, as work progresses.
- .3 Container and Equipment Decontamination  
Enclosure System:
  - .1 Container and Equipment Decontamination  
Enclosure System consists of Staging Area  
within work area, Washroom, Holding Room, and  
Unloading Room. Purpose of system is to  
provide means to decontaminate waste  
containers, scaffolding, waste and material  
containers, vacuum and spray equipment, and  
other tools and equipment for which Worker  
Decontamination Enclosure System is not  
suitable.
    - .1 Staging Area: designate Staging  
Area in work area for gross removal of  
dust and debris from waste containers and  
equipment, labelling and sealing of waste  
containers, and temporary storage pending  
removal to Washroom. Equip Staging Area  
with curtained doorway to Washroom.
    - .2 Washroom: build Washroom between  
Staging Area and Holding Room with two  
curtained doorways, one to Staging Area  
and one to Holding Room. Provide high -  
pressure low - volume sprays for washing  
of waste containers and equipment. Pump  
waste water through 5 micrometre filter  
system before directing into drains.  
Provide piping and connect to water  
sources and drains.
    - .3 Holding Room: build Holding Room  
between Washroom and Unloading Room, with  
two curtained doorways, one to Washroom  
and one to Unloading Room. Build Holding  
Room sized to accommodate at least two  
waste containers and largest item of  
equipment used.
    - .4 Unloading Room: build Unloading  
Room between Holding Room and outside,  
with two curtained doorways, one to  
Holding Room and one to outside.
- .4 Construction of Decontamination Enclosures:
  - .1 Build suitable framing for enclosures or  
use existing rooms where convenient, and line  
with polyethylene sheeting sealed with tape.

3.1 PREPARATION  
(Cont'd)

- .4 (Cont'd)
  - .1 (Cont'd)

Use one two layer s of FR polyethylene on floors.
  - .2 Build curtained doorways between enclosures so that when people move through or when waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.
- .5 Maintenance of Enclosures:
  - .1 Maintain enclosures in tidy condition.
  - .2 Ensure that barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
  - .3 Visually inspect enclosures at beginning of each working period.
  - .4 Use smoke methods to test effectiveness of barriers when directed by Departmental Representative.
- .6 Do not begin Asbestos Abatement work until:
  - .1 Arrangements have been made for disposal of waste.
  - .2 For wet stripping techniques, arrangements have been made for containing, filtering, and disposal of waste water.
  - .3 Work areas and decontamination enclosures and parts of building required to remain in use are effectively segregated.
  - .4 Tools, equipment, and materials waste containers are on hand.
  - .5 Arrangements have been made for building security.
  - .6 Warning signs are displayed where access to contaminated areas is possible.
  - .7 Notifications have been completed and other preparatory steps have been taken.

3.2 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos containing materials.

3.3 ASBESTOS  
REMOVAL

- .1 Before removing asbestos:
  - .1 Prepare site.
  - .2 Spray asbestos material with water containing specified wetting agent, using airless spray equipment capable of providing "mist" application to prevent release of fibres. Saturate asbestos material sufficiently to wet it to substrate without causing excess dripping. Spray asbestos material repeatedly during work process to maintain saturation and to minimize asbestos fibre dispersion.
- .2 Remove saturated asbestos material in small sections. Do not allow saturated asbestos to dry out. As it is being removed pack material in sealable plastic bags 0.15 mm minimum thick and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure that containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brushed and wet sponged surfaces from which asbestos has been removed to remove visible material. During this work keep surfaces wet.
- .5 Where Departmental Representative decides complete removal of asbestos containing material is impossible due to obstructions such as structural members or major service elements, or because asbestos containing material was originally applied to asphaltic coating, and provides written direction, encapsulate material as follows:
  - .1 Apply surface film forming type sealer to provide 0.635 mm minimum dry film thickness over sprayed asbestos surfaces. Apply using airless spray equipment to avoid blowing off fibres. Use different colour for each coat. Use colour for final coat. Apply penetrating

3.3 ASBESTOS  
REMOVAL  
(Cont'd)

- .5 (Cont'd)
  - .1 (Cont'd)

type sealer to penetrate existing sprayed asbestos surfaces to uniform depth of 25mm minimum. Apply penetrating type sealer to penetrate existing sprayed asbestos surfaces uniformly to substrate.
- .6

After wire brushing and wet sponging to remove visible asbestos, and after encapsulating asbestos containing material impossible to remove, wet clean entire work area including Equipment and Access Room, and equipment used in process. After 24 hour period to allow for dust settling, wet clean these areas and objects again. During this settling period no entry, activity, or ventilation will be permitted. After second 24 hour period under same conditions, clean these areas and objects again using HEPA vacuum followed by wet cleaning. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Allow at least 16 hours with no entry, activity, ventilation, or disturbance other than operation of negative pressure units during this period.
- .7

Work is subject to visual inspection and air monitoring. Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas. Air monitoring will be provided by the Departmental Representative.
- .8

Cleanup:

  - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
  - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
  - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
  - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and

3.3 ASBESTOS  
REMOVAL  
(Cont'd)

- .8 Cleanup:(Cont'd)  
.4 (Cont'd)  
Federal authority having jurisdiction.  
Supervise dumping and ensure that dump  
operator is fully aware of hazardous nature of  
material to be dumped and that guidelines and  
regulations for asbestos disposal are  
followed.  
.5 Perform final thorough clean-up of  
Asbestos Work Areas and adjacent areas  
affected by Work using HEPA vacuum.

3.4 FINAL CLEANUP

- .1 Following cleaning specified in above, and  
when air sampling shows that asbestos levels  
on both sides of seals do not exceed 0.01  
fibres/cc as determined by membrane filter  
method at 400-500X magnification phase  
contrast illumination, as described in NIOSH  
Method 94-113 or equivalent, proceed with  
final cleanup.
- .2 Remove polyethylene sheet by rolling it away  
from walls to centre of work area. Vacuum  
visible asbestos containing particles observed  
during cleanup, immediately, using HEPA vacuum  
equipment.
- .3 Place polyethylene seals, tape, cleaning  
material, clothing, and other contaminated  
waste in plastic bags and sealed labelled  
waste containers for transport.
- .4 Include in clean-up Work areas, Equipment and  
Access Room, Washroom, Shower Room, and other  
contaminated enclosures.
- .5 Include in clean-up sealed waste containers  
and equipment used in Work and remove from  
work areas, via Container and Equipment  
Decontamination Enclosure System, at  
appropriate time in cleaning sequence.
- .6 Conduct final check to ensure that no dust or  
debris remains on surfaces as result of  
dismantling operations and carry out air  
monitoring again to ensure that asbestos  
levels in building do not exceed 0.01  
fibres/cc. Repeat cleaning using HEPA vacuum  
equipment, or wet cleaning methods where  
feasible, in conjunction with sampling until  
levels meet this criteria.

- 3.4 FINAL CLEANUP .7 (Cont'd) As work progresses, and to prevent exceeding available storage capacity on site, remove sealed and labelled containers containing asbestos waste and dispose of to authorized disposal area in accordance with requirements of disposal authority. Ensure that each shipment of containers transported to dump is accompanied by Contractor's representative to ensure that dumping is done in accordance with governing regulations.
- 3.5 AIR MONITORING .1 To be provided by the Departmental Representative and all abatement work to be coordinated so that Departmental Representative has ample time to arrange the work.
- .2 A minimum of 48 hours notice required prior to abatement to allow the proper notifications to go out to the building.
- 3.6 INSPECTION .1 Perform inspection of Asbestos Work Area to confirm compliance with specification and governing authority requirements. Deviations from these requirements that have not been approved in writing by Departmental Representative may result in Work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect Work for:
- .1 Adherence to specific procedures and materials.
- .2 Final cleanliness and completion.
- .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
- .3 When asbestos leakage from Asbestos Work Area has occurred or is likely to occur Departmental Representative may order Work shutdown.
- .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.



Fisheries and Oceans  
Canada

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Canada

# **Bedford Institute of Oceanography**

## **HAZARDOUS MATERIALS ENVIRONMENTAL MANAGEMENT PLAN**

**January 2013**

<i>Hazardous Materials Environmental Management Plan – Bedford Institute of Oceanography</i>		
<i>Prepared by: Environmental Officer, Environmental Management</i>	<i>Approved by: Manager, Environmental Management</i>	
<i>Issue Date: March 2008</i>	<i>Revision #: 2</i>	<i>Revision Date: January 2013</i>

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## REVISION HISTORY

REVISION NUMBER	REVISION DATE	NATURE OF REVISION	APPROVAL
0	Initial Issue – March 2006		
1	March 2008		
2	January 2013	Format update (in line with EMS requirements); Update on legislation; Update Contacts; Add regional SOP	Diane Tremblay, Manager, Environmental Management

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## 1.0 INTRODUCTION

Environmental protection is fundamental to the mandate of Fisheries and Oceans Canada (DFO) and at its operational facilities including the Bedford Institute of Oceanography (BIO). Senior managers, supervisors, and employees at the Facility are committed to the common goal of protecting the environment through a number of management principles. A Hazardous Materials Environmental Management Plan (EMP) is an important aspect of managing facility environmental risks and is a critical element to the achievement of departmental environmental policy goals.

The management and staff of BIO are committed to the safe and efficient handling of chemicals and hazardous materials. To achieve this goal, BIO has implemented a *Chemical Management Policy* which will complement this Hazardous Materials Environmental Management Plan. While the Chemical Management Policy is concerned with employee safety, the Hazardous Materials Environmental Management Plan is mainly concerned with environmental protection, so that both critical elements are effectively managed.

### 1.1 Purpose, Objectives and Scope

The **purpose** of the EMP is to establish consistent effective management practices and to ensure that DFO is:

- aware of facilities and operations where hazardous materials are being used
- using and storing hazardous materials in a safe manner and environmentally responsible manner
- considering the purchase of alternative, more environmentally friendly products on a systematic basis
- planning for effective and immediate spill response
- disposing of hazardous materials by competent, licensed waste handlers in conformity with federal and local requirements
- training staff on safe use and handling of hazardous materials, on spill response, and on the appropriate processes for disposal

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The overall **objectives** of the Plan are to:

- establish standards of reasonable care;
- reduce the risk of accidental releases of hazardous materials to the environment as a result of DFO activities, or on DFO property; and
- continuously improve DFO's practices and performance in matters and activities that have the potential to affect the environment.

The **scope** of the Plan covers:

- DFO operations and employees at BIO
- tenants who share services or use BIO
- contractors working on behalf of DFO
- casuals, terms and visitors to BIO

## **1.2 Applicability of the EMP**

A hazardous material is defined as any substance or material that could adversely affect the health or safety of those who are exposed to it during use, storage, handling and/or disposal. This EMP has been developed to assist staff in safely performing their job functions when working with or near Hazardous Materials. All facility staff who use or are routinely exposed to hazardous materials, at a minimum, should read this EMP and become familiar with the following basic elements:

- Compliance with Regulatory Requirements
- Roles and Responsibilities
- Work Procedures
- Inspection/Monitoring
- Training
- Labelling and Record Keeping

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### **1.3 Hazardous Materials Inventory**

Hazardous materials used or stored at BIO have been grouped into categories as follows:

- Petroleum Products
- Glycol
- Halocarbons
- Asbestos Containing Materials
- Maintenance and Operation Chemicals
- Laboratory Chemicals

Waste Hazardous Materials include any of the above Hazardous Materials which are no longer useful; have reached their “best before” or “expired” date, or have become contaminated during use and which is destined for disposal, recycling or recovery.

The most recent inventories of the above hazardous materials can be found in the following individual plans and databases:

Petroleum Products	-	Storage Tank Management Plan / Environmental Emergency Response Plan
Glycol	-	Environmental Emergency Response Plan
Halocarbons	-	Stand Alone Inventory (Updated in 2012)
Asbestos Containing Materials	-	Asbestos Management Plan
Maintenance and Operating Chemicals	-	Stand Alone Inventory (Updated in 2012)
Laboratory Chemicals	-	Chemical Inventory Database

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## **1.4 Organization of the EMP**

The Hazardous Materials Environmental Management Plan (EMP) for the BIO is detailed in this report, which is organized in five sections. The introduction, purpose, scope and objectives of the EMP and other background information is provided in Section 1.0. An overview of compliance issues associated with the management, storage, handling or use of hazardous materials, and the relevant legislation that applies, is provided in Section 2.0, with further details provided in Appendix B. The roles and responsibilities of key personnel in the management of hazardous materials at the facility are identified in Section 3.0. The specific hazardous materials work procedures to be used are detailed in Section 4.0. The hazardous building materials which have been identified as being a concern at the BIO are summarized in Section 5.0. Additional supporting information is provided in Appendices A through D.

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## 2.0 OVERVIEW OF COMPLIANCE ISSUES

The most pertinent legislation related to the management of Hazardous Materials is summarized in Table 2.1 below, with further details of each of these acts or regulations provided in Appendix B.

<b>Table 2.1: Hazardous Materials Legislation Applicable to BIO</b>	
<b>Name of Act or Regulation</b>	<b>Applicability</b>
<b>FEDERAL LEGISLATION</b>	
<i>Canadian Environmental Protection Act, 1999</i> - “toxic” substances - National Pollutant Release Inventory (NPRI) - Canadian Environmental Quality Guidelines	<ul style="list-style-type: none"> <li>• Storage, use or release of toxic substances</li> <li>• Reporting of releases and transfers under the NPRI</li> </ul>
<i>Federal Halocarbon Regulations, 2003</i>	<ul style="list-style-type: none"> <li>• Storage of fluorocarbons (halocarbons)</li> <li>• Servicing and maintenance of equipment containing fluorocarbons</li> </ul>
<i>Environmental Emergency Regulations</i>	<ul style="list-style-type: none"> <li>• Storage of fluorocarbons</li> <li>• Storage of ethylene glycol</li> </ul>
<i>Storage of PCB Material Regulations</i>	<ul style="list-style-type: none"> <li>• Storage and handling of PCBs and PCB-containing equipment</li> </ul>
<i>Export and Import of Hazardous Wastes Regulations</i>	<ul style="list-style-type: none"> <li>• Shipment of hazardous wastes into or out of Canada</li> <li>• Export and import permits</li> <li>• Manifesting and documentation requirements</li> </ul>
<i>Interprovincial Movement of Hazardous Wastes Regulations</i>	<ul style="list-style-type: none"> <li>• Shipment of hazardous wastes within Canada</li> <li>• Manifesting and documentation requirements</li> </ul>
<i>CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products</i>	<ul style="list-style-type: none"> <li>• Storage and handling of petroleum products</li> </ul>
<i>Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations SOR/2008-197</i>	<ul style="list-style-type: none"> <li>• Storage and handling of petroleum products</li> </ul>
<i>Fisheries Act</i>	<ul style="list-style-type: none"> <li>• Releases of deleterious substances</li> </ul>
<i>Hazardous Products Act (and Regulations)</i>	<ul style="list-style-type: none"> <li>• Storage and handling of hazardous products</li> <li>• WHMIS requirements</li> </ul>
<i>Canada Labour Code, Part II</i>	<ul style="list-style-type: none"> <li>• Material handling requirements</li> <li>• Employee training and awareness</li> <li>• Workplace exposure to chemicals</li> </ul>
<i>Transportation of Dangerous Goods Act (and Regulations)</i>	<ul style="list-style-type: none"> <li>• Handling, offering for transport and transporting dangerous goods</li> <li>• Receipt of dangerous goods</li> <li>• Shipment of any dangerous goods from facility</li> </ul>
<i>The National Fire Code of Canada</i>	<ul style="list-style-type: none"> <li>• Storage of flammable and combustible products</li> </ul>

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<b>Table 2.1: Hazardous Materials Legislation Applicable to BIO</b>	
<b>Name of Act or Regulation</b>	<b>Applicability</b>
<i>Nuclear Safety and Control Act</i>	<ul style="list-style-type: none"> <li>Storage, handling and disposal of radioactive materials</li> <li>Licensing of any radioisotope-containing equipment (e.g., density meters, scanners)</li> </ul>
<i>Explosives Act</i>	<ul style="list-style-type: none"> <li>Storage and use of explosive substances including flares</li> </ul>
<b>PROVINCIAL LEGISLATION (PROVINCE OF NOVA SCOTIA) (*)</b>	
<i>Environment Act</i>	<ul style="list-style-type: none"> <li>Release of a contaminant to the environment</li> </ul>
<i>Dangerous Goods Management Regulations</i>	<ul style="list-style-type: none"> <li>Storage, handling, disposal, and transportation of dangerous goods and waste dangerous goods</li> </ul>
<i>Emergency Spill Regulations</i>	<ul style="list-style-type: none"> <li>Reporting of spills or unauthorized releases of chemicals, wastes, and dangerous goods</li> </ul>
<i>Petroleum Management Regulations</i>	<ul style="list-style-type: none"> <li>Storage and handling of petroleum products</li> </ul>
<i>Used Oil Regulations</i>	<ul style="list-style-type: none"> <li>Storage, handling, and disposal of used oil</li> <li>Disposal at approved return facilities</li> </ul>
<i>Asbestos Waste Management Regulations</i>	<ul style="list-style-type: none"> <li>Storage, handling, and disposal of asbestos wastes</li> </ul>
<i>Solid-Waste Resource Management Regulations</i>	<ul style="list-style-type: none"> <li>Management of solid waste</li> </ul>
<i>Occupational Health and Safety Act</i>	<ul style="list-style-type: none"> <li>WHMIS requirements</li> <li>Employee training and awareness</li> <li>Workplace exposure to chemicals</li> <li>Various regulations, guidelines and codes of practice related to asbestos</li> </ul>
<i>Workplace Hazardous Materials Information System (WHMIS) Regulation</i>	<ul style="list-style-type: none"> <li>WHMIS requirements</li> <li>Employee training and awareness</li> <li>Workplace exposure to chemicals</li> </ul>

(\*) Provincial Regulatory Requirements, in most cases, do not apply on federal sites but are listed for information purposes and as Best Management Practices in some cases. See Appendix B.



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### **3.0 ROLES AND RESPONSIBILITIES**

Every employee has a role to ensure that hazardous materials in the workplace are effectively managed and, to that end, specific roles and responsibilities of personnel related to the implementation of, and compliance with, this Hazardous Materials Environmental Management Plan (EMP) have been defined. Managers will ensure relevant hazardous material information and legislative changes are provided to employees as required, and will ensure that those employees are fully trained to handle the materials safely and in an environmentally responsible manner.

The PWGSC Property Manager (for hazardous materials related to operational and maintenance activities) and the Chemical Coordinator or Laboratory Health and Safety Committee designate (for laboratory hazardous materials (chemicals)) will monitor the implementation of the Hazardous Materials Management Plan, and will assist managers in achieving compliance.

#### **3.1 Key Management and Supervisory Personnel and Emergency Response Contacts**

The key management/supervisory personnel and emergency response contact numbers for BIO are presented in Table 3.1. The facility is managed by several groups – PWGSC who look after the building maintenance and infrastructure and DFO who look after the research and administrative activities for their department occurring at the facility. Other tenants are also present on site and they are responsible for their own activities within the confines of the overall facility requirements. PWGSC is responsible for regulatory and facility EMS compliance with respect to the facility maintenance and operational hazardous materials such as paints, solvents, greases etc. DFO is responsible for the regulatory and facility EMS compliance with respect to laboratory hazardous materials. Tenants are responsible for regulatory compliance and following their own EMS policies. Where they interact with BIO DFO or PWGSC, or use common areas within the facility, tenants must comply with the facility EMS.

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<b>Table 3.1 Contact List for BIO</b>		
<b><u>PWGSC Call Centre</u></b>		1 800 463 1850
<b><u>Commissionaire</u></b>		426 2373
<b><u>Local Emergency Services</u></b>		
Fire Department		911
Ambulance		911
Police RCMP		911
Poison Control		911
<b><u>Government Contacts</u></b>		
Coast Guard Operations Centre (24 hours)		1 800 565 1633
Environment Canada		426 7231
Nova Scotia Department of the Environment and Labour		
• Emergencies		1 800 565 1633
• General Inquiries		902 424 5300
<b><u>BIO Contacts</u></b>	<b><u>Office 426-3490</u></b>	<b><u>Cellular 292-4638</u></b>
Facility Director - Alain Vezina		
<b><u>Real Property Portfolio Management</u></b>	<b><u>Office</u></b>	<b><u>Cellular</u></b>
Manager: Vera Allen	426-2696	220-5123
Facility Engineer: Erica Copeland	426-5003	293-2245
<b><u>PWGSC Contacts</u></b>	<b><u>Office</u></b>	<b><u>Cellular</u></b>
Property Manager: Leo Lohnes	902-426-4487	902-483-1447
Maintenance Supervisor: Tony Barkhouse, Geoff Gritten	902-426-8849	902-293-0460; 497-9561
Buildings Supervisor: Craig Sandford	902-426-9610	902-222-4731
Lab Building: Bill Wood	902-426-8472	902-880-7290
<b><u>BIO / DFO Chemical Management Team</u></b>	<b><u>Office</u></b>	<b><u>Cellular</u></b>
Team Leader: Sherry Niven	SN: 426-3246	SN: 225-6005
<b><u>BIO OHS Coordinators:</u></b>		
Bettyann Power	<b><u>BAP: 426-2684</u></b>	<b><u>BAP: 452-7021</u></b>
Sherry Niven	<b><u>SN: 426-3246</u></b>	<b><u>SN: 225-6005</u></b>
Chemical Coordinator: Brian Robinson	<b><u>BR: 426-3639</u></b>	
NRCan Environmental Representative: Owen Brown	<b><u>OB: 426-3799</u></b>	
Radiation Safety Officer: Rick Nelson	<b><u>RN: 426-4332</u></b>	
Formaldehyde Storage Room Coordinator: Jeff Spry	<b><u>JS: 426-9228</u></b>	
<b><u>DFO/BIO Laboratory OSH Committee:</u></b>		
Lorraine Hamilton	<b><u>LH: 426-5458</u></b>	
Gerry Young - Co-Chair	<b><u>GY: 426-3294</u></b>	
<b><u>Tenant Contacts</u></b>	<b><u>Office</u></b>	
Environment Canada: Dave MacArthur	<b><u>DM: 426-6296</u></b>	
NRCan: Ross Boutilier, Planning and Operations Manager	<b><u>RB: 426.9999</u></b>	
Department of National Defence: Scott Moody	<b><u>SM: 427-7759</u></b>	
<b><u>Safety, Security and Emergency Services</u></b>	<b><u>SH: 426.6199</u></b>	
Occupational Health and Safety Advisor: Sherry Hannah, Nancy O'Donnell,	<b><u>NO: 426.9809</u></b>	
Emergency Services Advisor: Alison MacIntosh	<b><u>AM: 426.9444</u></b>	
<b><u>Fire Chief and Safety Officer</u></b>	<b><u>426.3490</u></b>	
Alain Vezina		
<b><u>Environmental Management System Coordinator</u></b>	<b><u>Office</u></b>	
Jo-Ann Nause Environmental Officer, Environmental Management, RPSS		902 426 6726

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## **3.2 Specific Roles and Responsibilities**

Brief descriptions of the roles and responsibilities of the key personnel at BIO are provided below.

### **3.2.1 Facility Director**

The responsibilities of the Facility Director are to:

- Receive Environmental Incident Reports (see Appendix D)
- Ensure that incidents are reported to the respective regulatory authorities as appropriate
- Maintain overall responsibility for the implementation of relevant policies and procedures, ensuring their communication to all staff, and to monitor and report on the success of their implementation
- Communicate procedures, incidents, and other matters relating to hazardous materials to DFO Senior Management
- Ensure all employees are familiar with BIO fire and emergency response procedures
- Maintain overall responsibility (which is delegated to staff) for the proper management, storage, handling, and disposal of all hazardous materials at the BIO facility
- Communicating the importance of the Hazardous Materials Environmental Management Plan
- Reviewing all aspects of the EMP including implementation and operation, checking and corrective actions with a focus on continual improvement

### **3.2.2 Regional Office of Environmental Coordination (ROEC) EMS Coordinator**

The responsibilities of the ROEC EMS Coordinator include:

- Coordinating and managing the appropriate environmental training programs for personnel involved with the operation, management and maintenance of the facility
- Maintaining worker training records related to the Hazardous Materials Environmental Management Plan
- Conducting annual reviews of the implementation of the EMP to ensure relevant tasks and responsibilities of individuals identified are being carried out and required documents and records are complete and maintained
- Receiving and retaining copies of forms, manifests, incident reports, and investigation reports related to the EMP

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### **3.2.3 Property Manager**

The Property Manager is responsible for environmental management components related to facility operations and maintenance. This includes:

- overall coordination, management, record keeping, and updating of operational and maintenance hazardous material inventories and work procedures at the facility
- ensuring that the relevant documentation, reports and manifests are completed and submitted to the relevant regulatory authorities, act as liaison with the regulatory authorities
- obtaining import or export permits, if required
- complete the environmental incident report and distribute to Facility Director, Director of Real Property and the EMS Coordinator

### **3.2.4 Chemical Management Team**

The role of the chemical management team (which includes all members of the Laboratory Health and Safety Committee) is to:

- monitor the application of the Chemical Management Policy to ensure success
- support the Chemical Coordinator in monitoring the Chemical Management Policy

(Note: The Team is not responsible for the implementation of the Chemical Management Policy – this is the responsibility of the local supervisors and respective Section and Division Heads.)

### **3.2.5 Chemical Coordinator**

The role of the Chemical Coordinator is primarily related to the laboratory chemicals used throughout the BIO facility. It is advisory in nature and does not diminish the responsibilities of line managers. The responsibilities of the Chemical Coordinator, in conjunction with the Chemical Management Team, are:

The **Chemical Coordinator** is responsible to:

- 1) Ensure that the existence of the BIO Chemical Inventory is advertised to chemical stores users. Marshared\ Science\ Environmental Research Division\ BIO Chemical Inventory\ Spreadsheets. It is the responsibility of individual users to maintain their own inventories. Make inventory available to BIO Commissionaire as per Fire Marshal orders.
- 2) Address any issues of a chemical nature in the chemical storage areas. This entails allocating storage space, proper storage of chemicals, proper identification of chemicals

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- 3) Meet with PWGSC Ellis Building maintenance personnel to go over the chemicals, in storage facility that needs to go for disposal (contracted out). This generally occurs once annually.
- 4) Be available for semi-annual inspections by the Lab OSH committee and address issues/deficiencies
- 5) Stock waste disposal labels for proper use of chemical wastes
- 6) Maintain a Chemical Inventory User group through correspondence with IT. Changes – i.e. addition or deletion of names done through chemical co-ordinator
- 7) Liaison with DFO's Real Property, Safety and Security (RPSS) unit regarding BIO's Environmental Management System (EMS)
- 8) Maintain membership on the BIO Laboratory OSH subcommittee
- 9) Provide an Annual Report of Activity to the BIO Director (Regional Director of Science) by December of each calendar year.

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### **3.2.6 Formaldehyde Storage Room Coordinator**

#### **Formaldehyde Storage Room – Coordinator and Procedures**

The formaldehyde storage room houses samples preserved in formaldehyde for all the departments at the Bedford Institute of Oceanography, including the Department of Fisheries and Oceans, Natural Resources Canada, and Environment Canada.

The Coordinator is responsible for supplying the information on disposal of these samples or any formaldehyde once no longer needed. All samples are to be stored in proper containers and labeled.

The formaldehyde storage room houses samples preserved in formaldehyde for all the departments at the Bedford Institute of Oceanography and including the Department of Fisheries and Oceans, Natural Resources Canada, and Environment Canada.

The following information is posted on the door to the Formaldehyde Storage Room.

#### **Formaldehyde Storage Room – Ellis Lab 222 - Users Information**

*Coordinator: Jeff Spry, DFO, Ocean and Ecosystem Sciences Division  
426.9228 (workstation Ellis Lab, 3-12)*

- The use of gloves and safety goggles is recommended during the handling of cases of samples preserved in formaldehyde.
- Formaldehyde spill kits are available in the storage room.
- If an employee must deal with a small spill or leak; it is expected that a respirator will be worn as a minimum (full-face respirator is recommended). If not available to individual; respirators can be obtained from Jeff Spry.
- If there is a spill, then a hazardous occurrence incident report (HOIR) must be completed by the supervisor using form available at <file:/ R:\Science\BIO OSH\HOIRs - Reporting Accidents and Near Misses\OSH Reporting>

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- Samples kept in glass or small plastic containers must be placed in sound wooden or cardboard cases, not stacked loosely, to prevent accidental breakage. Containers must be placed upright and clearly labelled to indicate ownership and date of collection.
- Cases of samples are not to be left on the floor between the rows of shelves.
- Very heavy cases are not to be placed on the upper shelves.
- No metal caps are to be used. These rust within a few years when exposed to the sea water found in most samples. Plastic caps are available from a variety of sources.

### **3.2.7 Radiation Safety Officers**

The Radiation Safety Officers (RSOs) and Site Radiation Safety Officers (SRSOs) have full responsibility and authority over the acquisition, possession, use and disposal of radioactive materials by anyone working at the site, regardless of divisional lines of authority. The RSOs:

- can recommend training for radioisotope users as may be required to fully comply with the Canadian Nuclear Safety Commission's (CNSC) regulatory requirements as set out in the Nuclear Safety and Control Act (NSCA)
- review and approve procedures to use unsealed radioisotopes prior to implementation

### **3.2.8 Tenants**

Tenants are responsible for:

- regulatory compliance
- following their own individual environmental management policies
- complying with the BIO environmental management policies and procedures where they interact with DFO or PWGSC, or use common areas within the facility

### **3.2.9 Other Key Staff**

The responsibilities of other staff include implementing the procedures documented in this EMP.

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## **4.0 HAZARDOUS MATERIALS AND WASTE HAZARDOUS MATERIALS MANAGEMENT PROCEDURES**

### **4.1 Objectives**

Procedures for the management of some hazardous materials including Petroleum Products, Glycol, Halocarbons and Asbestos Containing Materials have been separately documented in other management plans for this facility. They have therefore not been duplicated here.

Procedures for the various types of Maintenance and Operation Chemicals and Laboratory Chemicals used throughout the facility are presented in this section. These procedures provide facility managers and staff with clear guidance as to the conduct of activities and operations related to hazardous materials with specific emphasis on the management, storage, handling, and disposal of hazardous materials.

The overall objectives of the work procedures are to:

- Ensure the proper management, storage, handling, and disposal of hazardous materials in accordance with applicable legislation.
- Prevent unwarranted employee exposure to dangerous chemicals.
- Ensure the purchase of the safest chemicals.
- Encourage the practice of minimizing the stores of chemicals and “just in time” purchasing.
- Provide a monitoring program, which monitors the location, use and storage of chemicals.
- Enforce the WHMIS to ensure current information on chemicals on site is readily available to employees.
- Ensure a chemical awareness training program for employees.
- Ensure activities are compliant with departmental OSH requirements.



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## 4.2 Reducing Worker Exposure to Hazardous Materials

The following procedure applies to areas at BIO where hazardous materials and waste hazardous materials are used / handled and/or stored.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that the Regional SOP for Managing Hazardous Materials (Appendix C) is followed	Facility Director (or designate) and Tenants
Provide health and safety information, instruction, training, and supervision necessary to employees. (This is legally required under the Canadian Labour Code Part II).	Facility Director (or designate) and Tenants
Avoid unprotected exposure wherever possible.	Staff
Where avoidance is not possible, minimize exposure to hazardous materials and waste hazardous materials.	Staff
Use appropriate personal protective equipment to minimize the risks associated with unavoidable exposure.	Staff
Be familiar with the contents of the MSDS for each hazardous material in the workplace and be aware of the special precautions and exposure limits (or threshold limit values) to minimize the risks.	Staff

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### 4.3 Procurement Practices

The following procedure applies to the procurement of Hazardous Materials (including Maintenance and Operation Chemicals and Laboratory Chemicals) at BIO.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that the Regional SOP for Managing Hazardous Materials (Appendix C) is followed	Facility Director (or designate) and tenants
<b>MAINTENANCE AND OPERATION CHEMICALS</b>	
<p>The bulk of the maintenance and operation chemicals are stored in the following areas:</p> <ul style="list-style-type: none"> <li>• Van Steenburg Building – Boiler Room</li> <li>• Van Steenburg Building – Workshop</li> <li>• Fish Laboratory – Boiler Room</li> <li>• Argo Building – Workshop</li> <li>• Level II Lab – 1<sup>st</sup> Floor Mechanical Room</li> </ul> <p>An MSDS binder, complete with an inventory of current maintenance and operations chemicals (updated monthly), is present in each of the above noted storage areas</p>	
Check to ensure that the chemical being ordered is the safest, most non-hazardous chemical possible for the particular application, and substitute for a safer chemical where possible.	Staff / Supervisors
Check the chemical inventory for availability at BIO. If the chemical is not available, complete internal requisition process.	Staff / Supervisors / Chemical Coordinator
Ensure purchased chemicals come with current MSDS.	Staff / Supervisors / Chemical Coordinator
Add any new chemicals to the chemical inventory (quantity, location and owner) and ensure the MSDS binder in the area where the chemical will be used is updated.	Chemical Coordinator
Monitor chemical purchases to ensure that needlessly large quantities of chemicals are not ordered.	Staff / Supervisors / Chemical Coordinator
<b>LABORATORY CHEMICALS</b>	
Inform Chemical Coordinator when any new chemicals are to be purchased	Staff
Ensure any new purchases comply with the BIO policy for use of radioisotopes and ozone depleting substances and the requirements of the Chemical Weapons Convention.	Chemical Coordinator
Purchase reasonable quantities of the safest chemical available for a particular use.	Staff

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<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure purchased chemicals come with current MSDS.	Staff
Add any new chemicals to the chemical inventory (quantity, location and owner) and ensure the MSDS binder in the area where the chemical will be used is updated.	Chemical Coordinator

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#### 4.4 Storage and Handling of Hazardous Materials

The following procedure applies to the storage and handling of Hazardous Materials at BIO.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that the Regional SOP for Managing Hazardous Materials (Appendix C) is followed	Facility Director (or designate) and tenants
Ensure site specific Material Safety Data Sheets (MSDSs) are available for Hazardous Materials on site (*)	Facility Director (or designate) and tenants
Ensure appropriate training (e.g. WHMIS and TDG) is provided to staff whose operational activities involve storage and/or handling of Hazardous Materials	Facility Director (or designate) and tenants
Take appropriate training	Staff
Become familiar with and follow the safe work practices and procedures identified in the Material Safety Data Sheet (MSDS) for the original hazardous material if the waste still exhibits the properties of the original material	Staff
Take the appropriate precautions for the storage and handling which are documented on MSDSs	Staff
Ensure that Hazardous Materials are stored in appropriately-labeled containers and handled in accordance with the manufacturer's instructions as well as any applicable provincial and federal regulations, codes, and guidelines	Staff / Facility Manager
Take all necessary precautions to prevent the spillage and release of hazardous materials to the environment and use appropriate spill containment measures when necessary (as detailed in the Environmental Emergency Response Plan for the facility).	Staff

(\*) At BIO, MSD Sheets are available as follows:

1. A laboratory or room-specific collection of MSD Sheets.
2. On line at the manufacturer's web site (for most chemicals)
3. The Canadian Centre for Occupational Health and Safety searchable database (<http://ccinfoweb.ccohs.ca/msds/search.htm>). There is a DFO subscription to this database and can be accessed by anyone through a valid DFO internet connection. This database is updated regularly and is the recommended source for updating BIO MSDS's.

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## 4.5 Storage and Handling of Waste Hazardous Materials

The following procedure applies to the storage and handling of Waste Hazardous Materials at BIO.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that the Regional SOP for Managing Hazardous Materials (Appendix C) is followed	Facility Director (or designate) and tenants
Ensure appropriate training (e.g.WHMIS and TDG) is provided to staff whose operational activities involve storage and/or handling of Waste Hazardous Materials	Facility Director (or designate) and tenants
Take appropriate training	Staff
Become familiar with and follow the safe work practices and procedures identified in the Material Safety Data Sheet (MSDS) for the original hazardous material if the waste still exhibits the properties of the original material	Staff
Take the appropriate precautions for the storage and handling which are documented on MSDSs	Staff
Segregate waste hazardous materials by type in designated, labeled containers which are suitable for the particular waste	Staff
Clearly label containers of waste hazardous materials as containing wastes. The label should include the contents of the container, the safety precautions to be taken, the estimated quantity of the waste hazardous material in the container and the date, as well as a warning to not dispose of the material without the prior approval of the Facility Manager	Staff
Store Waste Hazardous Materials in a locked ventilated metal cabinet or locked designated area in a room that is well ventilated	Staff
Store only waste hazardous materials that are known to not react violently with each other in the same general area. When in doubt about reactivity, segregate any chemicals which are “questionable”	Staff
Ensure that Waste Hazardous Materials are not stored near sources of extreme heat or cold, possible sparks, nor near any oxidizing environments or potentially oxidizing environments	Staff
Place surplus chemicals on BIO Chemical Exchange Shelves in the Chemical Stores	Staff
As necessary, transfer surplus chemicals to the BIO Chemical Exchange inventory or directly to outside recipients	Chemical Coordinator

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<b>TASK</b>	<b>RESPONSIBILITY</b>
Update Chemical Inventory whenever chemicals are disposed of	Staff / Chemical Coordinator
Coordinate an annual “clean up” day	Property Manager / Chemical Management Team

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## 4.6 Transportation and Disposal of Waste Hazardous Materials

The following procedure applies at BIO when Waste Hazardous Materials are stored on site prior to being transported off site for disposal.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that the Regional SOP for Managing Hazardous Materials (Appendix C) is followed	Facility Director (or designate) and tenants
Provide a designated area for the storage of Waste Hazardous Materials	Facility Director (or designate) and tenants
Consult with Environment Canada or the provincial Environment Department to determine the best possible means of disposal and to identify approved disposal facilities for the particular Hazardous Material or Waste Hazardous Material. The preferred disposal method of a particular waste hazardous material is to return these chemicals to the original manufacturer for recycling, wherever possible.	Staff / Supervisors
Engage a reputable, licensed waste collection and disposal company, as required. The provincial Environment Departments maintain lists of approved disposal companies for each type of waste. When in doubt, consult with the appropriate authorities for the proper disposal companies to use.	Property Manager (or designate) / Chemical Management Team
Classify the waste prior to shipping of any waste chemicals or waste hazardous materials. Ensure that the waste is classified in accordance with the <i>Interprovincial Movement of Hazardous Wastes Regulations</i> for in-province or trans-province shipments or the <i>Export and Import of Hazardous Wastes Regulations</i> for international shipments. <b>It is the responsibility of the generator of the waste to ensure its proper classification.</b> Often, reputable waste disposal companies may be able to assist in the proper classification of the waste.	Property Manager (or designate) / Chemical Management Team
Complete the Waste Manifest for Waste Hazardous Material shipments destined for out of province disposal. <b>It is also the responsibility of the generator of the waste to complete the proper manifest, and to ensure that a copy is provided to federal and provincial authorities,</b> prior to shipping the waste. Keep the manifests on file at BIO for at least 2 years.	Staff (must be trained in Transportation of Dangerous Goods)

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<b>TASK</b>	<b>RESPONSIBILITY</b>
<p>Leave intact consumer products that may contain hazardous materials (for example, mercury-containing thermostats, mercury-containing fluorescent lamps, PCB-containing light ballasts or capacitors, etc.) and take precautions at the end of their useful life to prevent breakage. At the end of their useful life, store them in separate designated containers (e.g. covered drums) and properly label the container until disposal is arranged. Note that in the case of PCB containing equipment, special federal and provincial requirements will apply, consistent with the <i>PCB Regulations</i> under CEPA. Consult with Environment Canada or the provincial Environment Department for specific storage, handling, and disposal requirements that may apply to the particular type of waste.</p>	Staff
<p>Always follow these general rules:</p> <ul style="list-style-type: none"> <li>• Never throw Waste Hazardous Materials in the garbage or pour them down the drain</li> <li>• Store Waste solvents and waste oils separately</li> <li>• Keep greasy or oily rags or materials in appropriate receptacles pending their removal from the site by an approved waste disposal facility, as required</li> </ul>	Staff



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## 4.7 Inspection and Monitoring

The following procedure applies to inspection and monitoring activities in areas where hazardous materials and waste hazardous materials are used / handled and / or stored at BIO.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that inspections are carried out in accordance with the Regional SOP (Appendix C) and that incidents of noncompliance are appropriately managed.	Facility Director (or designate) and tenants
Become familiar with the requirements of this EMP and the Regional SOP before conducting an inspection.	Designated Personnel
Conduct workplace inspections at least annually in areas where Hazardous Materials and Waste Hazardous Materials are used and stored.	Designated Personnel
During the inspection focus on adherence to the requirements of this EMP and the Regional SOP	Designated Personnel
Document and submit any equipment and infrastructure requirements to comply with the EMP for annual budget consideration.	Designated Personnel

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## 4.8 Training

The following procedure applies to satisfying training requirements for staff whose operational duties involve contact with hazardous materials and waste hazardous materials at BIO.

<b>TASK</b>	<b>RESPONSIBILITY</b>
Assess training needs; arrange for training and maintain documentation of training	Managers / Supervisors
Ensure that new employees, including casuals, students and contractors receive general information on hazardous materials management during their orientation, and ongoing training as processes, legislation and/or chemicals change	Managers / Supervisors
Ensure that staff have appropriate regulated training such as WHMIS and TDG; training in facility specific policies such as the “Chemical Management Policy” for BIO; the EMP	Managers / Supervisors
Ensure procedures are in place to have appropriate staff trained on relevant plans and procedures relative to environmental management at the facility (including any Environmental Management System training), and to document who has been trained	EMS Coordinator
Include in the training records employee name, type of training and date of training	Managers / Supervisors / EMS Coordinator

Note - WHMIS laws do not require that workers be issued a "certificate", card or any other document to demonstrate that they have received WHMIS education and/or training. Neither Health Canada nor any other regulatory authority issues WHMIS certificates to workers. If employees are interested in replacing a document which indicates that they have received WHMIS education, they should contact the individual / organization which issued it.

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## 4.9 Labeling and Record Keeping

The following procedure applies to labeling and record keeping requirements for hazardous materials and waste hazardous materials at BIO

<b>TASK</b>	<b>RESPONSIBILITY</b>
Ensure that the Regional SOP for Managing Hazardous Materials (Appendix C) is followed	Managers / Supervisors
As a minimum, place a label at a visible position on the container of the hazardous material in accordance with WHMIS requirements.	Staff / Supervisors
Develop and maintain an inventory of hazardous materials and waste hazardous materials on site and update regularly; maintain a binder of Material Safety Data Sheets (hard copy or electronic) and update regularly	Chemical Coordinator
Maintain work records documenting any waste hazardous materials disposal or transportation related activities for a minimum two year period	Property Manager
Maintain training records for the duration of employment plus 1 year.	Supervisors / Managers
For asbestos containing materials maintain the following indefinitely: <ul style="list-style-type: none"> <li>• Notification of the presence of asbestos containing materials and other asbestos related documents and correspondence with tenants, facility management staff, contractors and consultants. Maintain indefinitely</li> <li>• Notification sent to tenants prior to asbestos related work in their space or area</li> <li>• Inspection reports and incident reports, as well as any asbestos-related information</li> </ul>	Property Manager
Maintain indefinitely any Hazardous Materials inspection reports and incident reports	Property Manager

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## **5.0 HAZARDOUS BUILDING MATERIALS SURVEY**

The following materials have been identified as being of concern:

- Asbestos-containing materials (e.g. insulation coverings, putties and caulking, older equipment)
- Polychlorinated biphenyls (PCBs) (e.g. old fluorescent lighting ballasts, lab PCBs)
- Lead (e.g. lead paint, batteries)
- Mercury (e.g. thermostats, lighting lamps)

At BIO asbestos-containing materials were identified in 2005 (an inventory is presented in Appendix A).

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## APPENDIX A – SUMMARY OF HAZARDOUS MATERIALS INVENTORIES AT BIO



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### **Glycol Inventory**

Ethylene and propylene glycol at the Bedford Institute of Oceanography (BIO) is stored or in use in the locations identified in the table below (EERP, March 2008).

<b>Storage Locations Glycol</b>			
<b>Building</b>	<b>Floor</b>	<b>Room</b>	<b>Type of Glycol</b>
Strickland	Basement	Mechanical Room	Ethylene Glycol
Fish Laboratory	Ground	Boiler Room # 133	Ethylene Glycol
Fish Laboratory	1	Mechanical Room # FL-143	Ethylene Glycol
Vulcan	1	V-G55B (Compressor Room)	Propylene Glycol
Vulcan	1	V-G13A (Salt Bay)	Propylene Glycol
Vulcan	1	V-G42 (DTW Workshop)	Ethylene Glycol
Van Steenburg	5	Mechanical Room	Ethylene Glycol
Holland	5	Mechanical Room (Café)	Ethylene Glycol
Holland	3	Computer Room	Propylene Glycol
Murray	6	Mechanical Room	Ethylene Glycol
Murray	3	Core Storage	Ethylene Glycol
Level II Lab	1	Pump Room	Propylene Glycol
Level II Lab	6	Mechanical Room	Propylene Glycol

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### Asbestos Containing Material Inventory

The list of Asbestos Containing Materials (ACMs) was extracted from the Asbestos Management Plan ( March 2005 and updated January 2013)

MAIN SERVICE TOWER
<p><u>Mechanical</u></p> <ul style="list-style-type: none"> <li>- Friable asbestos-containing pipe fitting insulation. The insulation is parging cement (also known as joint mud) present on pipe fittings, which include but are not limited to elbows, ends, tees, valves and joints. The parging cement is beige to off-white in colour and contains 50 % Chrysotile asbestos. The asbestos-containing pipe fittings are located in the storage room located on Level One (Room MST-1B1-09).</li> </ul> <p>Note: Friable asbestos-containing pipe insulation may also be present within enclosed solid ceiling and wall systems, pipe chases or other inaccessible areas in the building.</p> <p><u>Flooring</u></p> <ul style="list-style-type: none"> <li>- Non-friable asbestos-containing vinyl floor tiles. The 12" x 12" square vinyl floor tiles are brown in colour with white and / or brown streaking and are located in several rooms of the building. The vinyl floor tiles contain 2 % Chrysotile asbestos.</li> </ul>

ARGO BUILDING
<p><u>Mechanical</u></p> <ul style="list-style-type: none"> <li>- Friable asbestos-containing pipe fitting insulation. The insulation is parging cement (also known as joint mud) present on pipe fittings, which include but are not limited to elbows, ends, tees, valves and joints. The parging cement is beige to off-white in colour and contains 65 % Chrysotile asbestos. The asbestos-containing pipe fittings are located in several rooms of the building including the mechanical room (AR-G33), in the ceiling plenum and on piping entering radiators at floor level.</li> </ul> <p>Note: Friable asbestos-containing pipe insulation may also be present within enclosed solid ceiling and wall systems, pipe chases or other inaccessible areas in the building.</p> <p><u>Flooring</u></p> <ul style="list-style-type: none"> <li>- Non-friable asbestos-containing vinyl floor tiles. The 12" x 12" square vinyl floor tiles are white in colour with brown streaking and are located in the main corridor of the building and in several adjacent offices. The vinyl floor tiles contain 2 % Chrysotile asbestos.</li> </ul> <p><u>Wall Finishes</u></p> <ul style="list-style-type: none"> <li>- Non-friable asbestos containing joint (drywall) compound. The joint (drywall) compound is present in joints, cracks and repaired areas on all original walls and older re-fits located throughout the building and on the ceiling in the overhead storage area in warehouse / storage / shop room (Room AR-G28). The joint compound is encapsulated with paint and contains 2 % Chrysotile asbestos.</li> </ul>



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<b>ACM Descriptions and Locations by Building</b>	
<b>HOLLAND BUILDING</b>	
<b><u>Flooring</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing vinyl floor tiles. The 12" x 12" square vinyl floor tiles are beige to brown in colour and are located on floors throughout the building. The vinyl floor tiles contain 3 % Chrysotile asbestos and may be covered by carpeting or "newer" vinyl sheet flooring.</li> </ul>
<b><u>Electrical</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos containing heat shield / reflective paper on incandescent lighting fixtures located on the ceiling in the Auditorium Storage Room (Room HM-3F5-15) located behind the stage. The incandescent paper is the heat shield that encircles the incandescent light fixtures, has a silver reflective appearance and consists of 20 % Chrysotile asbestos.</li> </ul>
<b><u>Exterior</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos containing "Transite" panels. The "transite" panel boards have a grey, fibrous, cementitious appearance and are fastened to the underside of exterior soffits. The "Transite" panels have been covered with an off-white texture coating and contain 35 % Chrysotile asbestos.</li> </ul>
<b>STRICKLAND BUILDING</b>	
<b><u>Flooring</u></b>	<ul style="list-style-type: none"> <li>- Non friable asbestos-containing vinyl floor tiles. The 12" x 12" square vinyl floor tiles are beige in colour with dark brown to white streaking and are located throughout the building. The vinyl floor tiles contain 2 % to 3 % Chrysotile asbestos.</li> <li>- Non-friable asbestos containing adhesive. The black mastic adhesive is underlying 12" x 12" floor tiles located in several rooms of the building. The black mastic adhesive contains 3 % Chrysotile asbestos.</li> </ul>
<b><u>Wall Finishes</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos containing joint (drywall) compound. The joint (drywall) compound is present in joints, cracks and repaired areas on all original walls and older re-fits located throughout the building. The joint compound is encapsulated with paint and contains 2 % to 3 % Chrysotile asbestos.</li> </ul>
<b><u>Furniture</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing "Transite" panel boards located in the corridor on the ground level (Room S-GG5-34). The "transite" panel boards have a grey, fibrous, cementitious appearance and are fastened to the walls. These "Transite" panel boards contain 35 % Chrysotile asbestos.</li> <li>- Non-friable asbestos-containing "Transite" lab benches. The "transite" lab benches are black and present on lab tables, benches and counters in Rooms S-2E4-30, S-2E4-31, S-2H3-38 and S-GC4-22. The lab benches contain 25 % Chrysotile asbestos.</li> </ul>

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<b>ACM Descriptions and Locations by Building</b>	
<b>STRICKLAND BUILDING – con’t</b>	
<b><u>Furniture (con’t)</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing “Transite” panel boards inside fume hoods and chemical cabinets. The “transite” panel boards have a grey, fibrous, cementitious appearance. They are fastened to the sides and top of a fume hood located in RoomS-GH2-45 and inside a chemical cabinet located in Room S-GE4-27. These “Transite” panel boards contain 25 % to 35 % Chrysotile asbestos.</li> </ul>
<b><u>Structure</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing “Transite” pipe located on the southwest interior wall in the basement level Mechanical Room (Room S-BB4-02). The “transite” pipe has a grey, fibrous, cementitious appearance and is connected to discharge pipes suspended from the ceiling. The “Transite” pipe was not assessed during the 2000 ACM survey, however, it likely contains between 25 % and 75 % Chrysotile asbestos.</li> </ul>
<b>MURRAY BUILDING</b>	
<b><u>Furniture</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing “Transite” lab benches. The “transite” lab benches are black and present on lab tables, benches and counters in Rooms 3B4-65, 3C4-25 and 4C3-26 of the building. The lab benches contain 35 % Chrysotile asbestos.</li> <li>- Non-friable asbestos-containing “Transite” panel boards inside fume hoods. The “transite” panel boards have a grey, fibrous, cementitious appearance and are fastened to the sides and top of a fume hood located in Room 3C4-25 of the building. These “Transite” panel boards contain 35 % Chrysotile asbestos.</li> </ul>
<b><u>Ceilings</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing “Transite” ceiling panel boards. The “transite” ceiling panel boards have been covered with a texture coating. The “transite” panels contain 35 % Chrysotile asbestos and are located on the ceiling in the atrium (Room 5E10-57) in the basement.</li> <li>- Friable asbestos-containing acoustic ceiling tiles (24” x 24”). The 24” x 24” ceiling tiles have a “fissure and pinhole” pattern and are located in Rooms 5A4-16 and 5B6-32. The 24” x 24” ceiling tiles contain 3 % Amosite asbestos.</li> </ul>
<b><u>Structure</u></b>	<ul style="list-style-type: none"> <li>- Non-friable asbestos-containing adhesive sealant. The adhesive sealant is black and is located along the concrete seam that exists between the Murray Building and Main Service Tower. The adhesive sealant contains 5 to 17 % Chrysotile asbestos.</li> </ul>
<b>CCG MARINE TRAFFIC CONTROL CENTRE &amp; BONEYARD STORAGE BUILDING</b>	
<p>Note: At the time this AMP was prepared, no asbestos survey was available for the CCG Marine Traffic Control Centre or the storage building in the Boneyard. Based on the age of these buildings, ACMs may be present.</p>	

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## BUNGALOW BUILDING

### Furniture

- Non-friable asbestos-containing "Transite" panel boards located inside the furnace room (Room GA1-01). The "transite" panel boards have a grey, fibrous, cementitious appearance and are fastened to the walls. These "Transite" panel boards contain 35 % Chrysotile asbestos.

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### **Maintenance and Operation Chemicals**

Maintenance and operation chemicals are used in the every day operation and maintenance of the facilities. They include such consumer products as paints, varnishes, lacquers, stains, and other coatings; lubricants such as engine oil, transmission oil, hydraulic oil, grease, and other lubricants (e.g. WD-40); solvents such as paint thinner; cleaners and disinfectants; degreasers; antifreeze; polishes; insecticides and herbicides; and miscellaneous acids and bases.

These chemicals were inventoried in 2011 and the full inventory detailed in a report entitled “***Report on an Inventory of HazMat and Halocarbons, Bedford Institute of Oceanography, Dartmouth, NS, March 2011***” which is available from the EMS Coordinator.

### **Laboratory Chemicals**

The chemical inventory database is set up on Excel spreadsheets in order to track chemicals at BIO in terms of quantity, location and ownership. Other pertinent information. is generally included in these spreadsheets. The chemical inventory database is located on the shared ‘R’ drive using the following pathway: *R:\Shared\Byron\Chemical Inventory Spreadsheets.*

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## **APPENDIX B - REGULATORY FRAMEWORK FOR HAZARDOUS MATERIALS MANAGEMENT**

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## **Regulatory Framework**

The existing regulatory framework that may apply to the operation of BIO is summarized in this section. The section is subdivided in two sections, the first dealing with federal legislation and requirements, and the second summarizing any provincial requirements that may be relevant to the facility.

It is noted that the synopsis of legislation provided below is intended solely for summary purposes, rather than offering a comprehensive listing of all regulatory requirements that may apply. This synopsis is also not intended to be construed as legal advice. Please refer to the official text of each specific Act or Regulation for the specific requirements that may apply.

## **FEDERAL LEGISLATION RELATED TO HAZARDOUS MATERIALS**

### **Canadian Environmental Protection Act (CEPA)**

The *Canadian Environmental Protection Act, 1999* (“CEPA”) is administered by Environment Canada. The specific requirements of *CEPA* that apply to the facility include:

- the “toxic substances” provisions of CEPA (Part 5 of CEPA);
- the general provisions of CEPA relating to the National Pollutant Release Inventory (NPRI) (Section 46); and
- the general provisions of CEPA relating to the Canadian Environmental Quality Guidelines (Section 54).

### **“Toxic” Substances**

Part 5 of the *Canadian Environmental Protection Act, 1999* establishes the requirements for toxic substances in Canada. The framework for “virtual elimination” or lifecycle management of toxic substances is established in Section 65 of CEPA. A toxic substances list is established in Schedule A of CEPA, thereby requiring all listed substances to undergo virtual elimination or lifecycle management, in order to prevent environmental degradation or human health concerns. Part 4 of CEPA also establishes specific requirements for the development and implementation of Pollution Prevention Plans for specific substances. All “toxic substances” entering the environment as a result of release by DFO employees will be governed by the application of CEPA.

### **Federal Halocarbon Regulations, 2003**

The *Federal Halocarbon Regulations, 2003* (“FHR”) under CEPA establish the regulatory requirements for the management of releases of ozone depleting substances (ODS) and other halocarbons from federal facilities, in an effort to prevent the deterioration of the earth’s ozone layer. The regulations establish

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requirements for prohibiting releases of halocarbons from refrigeration and air conditioning systems, halon fire suppression systems, and solvent systems. Requirements include a general prohibition of releases, training requirements for servicing personnel, preventative leak checking and maintenance requirements on systems containing halocarbons, recovery and recycling requirements, and record keeping and reporting provisions, among other requirements.

### **Environmental Emergency Regulations**

The *Environmental Emergency Regulations* (“E2 Regulations”) under CEPA are intended to enhance the protection of the environment and human life and health by promoting the prevention of, preparedness for, and response to and recovery from environmental emergencies at fixed facilities, from the accidental release of flammable or other hazardous substances. The regulations require facilities that store, use, or otherwise handle any of the 174 listed substances, above a certain quantity stored or above a specified concentration of the substance, to:

- provide notification to the Minister of the Environment as to the specific substances stored, used, or handled, and their quantities and concentrations on-site;
- develop an Environmental Emergency Plan for which identifies measures to be implemented to prevent of accidents or releases of the substances, and to specify remedial actions to be undertaken in the event of an emergency. Environmental Emergency Plans are to be tested and updated annually; and
- report any environmental emergencies that may occur.

### **PCB Regulations**

The *PCB Regulations* under CEPA establish the requirements for the storage of polychlorinated biphenyls (PCBs) or equipment containing PCBs. The storage of PCBs must be conducted in a building or fenced area, with the PCBs or PCB-containing equipment stored in sealed containers or drums that are properly labelled, and the area must be equipped with suitable fire protection equipment. Record keeping, reporting, maintenance, and inspection requirements are also established.

### **Export and Import of Hazardous Wastes Regulations**

The *Export and Import of Hazardous Wastes Regulations* (“EIHWR”) under CEPA establish the requirements for the movement of hazardous wastes intended either for disposal or recycling into or out of Canada. Specific notification requirements to Environment Canada are established for the export or import of hazardous wastes into and out of Canada, as well as the requirement to obtain export and/or import permits. Specific requirements for liability insurance and the packaging of hazardous wastes as well as for transporters of such wastes are also established, including the requirement to carry completed



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manifests for such wastes. The EIHWR would apply to the facility if any hazardous wastes were shipped into or out of Canada for recycling or disposal.

### **Interprovincial Movement of Hazardous Wastes Regulations**

The *Interprovincial Movement of Hazardous Wastes Regulations* (“IMHWR”) under CEPA establish the requirements for manifesting and record keeping of hazardous waste movements across the provincial borders of Canada. The IMHWR require that shipments of hazardous wastes be documented in a shipping manifest according to the requirements of the federal *Transportation of Dangerous Goods Regulations*, and that copies of the manifests be kept at all times with the originator of the waste, the transporter of the waste, the receiver of the waste, and with copies forwarded to Environment Canada and the provincial authorities where the waste originated and was destined. The IMHWR would apply to the facility if any hazardous wastes were shipped from the facility, within Canada, for recycling or disposal.

### **Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations**

These regulations were promulgated under CEPA in June of 2008. The objective of the regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and Aboriginal lands and storage tank systems operated by federal departments and agencies, Crown corporations, and federally regulated organizations, such as airports, railways, and ports. They apply to tank systems which are over 2500 l aggregate capacity and contain requirements for a range of installation, operation, maintenance and decommissioning activities. They also specify requirements for emergency plans and reporting of spills.

### **Fisheries Act**

The intent of the federal *Fisheries Act* is to prevent harmful effects of contaminants, termed “deleterious substances”, on aquatic ecosystems such as fish. The Act prohibits the release of deleterious substances to the environment. While this term is relatively broad, its common interpretation is that an effluent which is acutely lethal to fish is considered to be a deleterious substance. In addition, the provisions of the Act relating to prohibiting the “harmful alteration, disruption, or destruction” (HADD) of fish or fish habitat require a specific authorization from Fisheries and Oceans Canada.

There are some changes proposed to the *Fisheries Act* which will result in a change from a focus on managing impacts to all fish habitat, to managing threats to fisheries. The current *Fisheries Act* provisions used for the review of project impacts require consideration of all projects, on all waters, regardless of the importance of fish species present or their contribution to fisheries. The Department’s goal is to move away from reviewing all projects on all waters, to focusing on managing threats to Canada’s commercial, recreational and Aboriginal fisheries. As well, penalties under the *Fisheries Act*

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would be harmonized with those in the *Environmental Enforcement Act*, resulting in appropriate fines based upon the severity of the offences.

In addition to the effective management of threats to fisheries, the proposed amendments include means to improve regulatory clarity, certainty and consistency. For example, rules would be established that enable proponents to comply with the *Fisheries Act* while carrying out their projects. This would include identifying classes of low-risk works (such as installing a cottage dock) and classes of waters where project reviews would not be required

There are also proposed amendments in support of enhancing partnerships with provinces and territories, industry and conservation groups. Where provinces and territories have laws or regulations for fisheries protection, including the deposit of deleterious substances, amendments would enable the provincial laws or regulations to be recognized as equivalent, such that the *Fisheries Act* or its regulations would not apply. The Department would also be able to enter into agreements with third parties (such as conservation groups or professional organizations) to carry out and further the purposes of the Act, including ensuring that newly proposed standards are communicated and clearly understood.

### **Hazardous Products Act and Regulations**

This Act defines the Workplace Hazardous Materials Information System (WHMIS). The Act specifies the need for supplier and workplace labels and Material Safety Data Sheets (MSDS), and specifies classification criteria.

### **Canada Labour Code, Part II**

Under the *Canada Labour Code Part II*, every employer is legally required to provide health and safety information, instruction, training, and supervision necessary to employees. The Code describes the employer's responsibility to inform employees about hazards and train them to work safely. These requirements are in concert with the WHMIS provisions of the Hazardous Products Act.

Part X Division I of the Code covers the substitution of substances, ventilation, storage, handling and use of hazardous substances, warnings on hazardous substances, employee education, control of hazards. The management of hazardous materials and dangerous goods are covered and steps must be taken to help prevent workplace exposure to hazardous materials and reduce releases to the environment.

Hazardous substances in the workplace must be stored and handled "in the manner prescribed".

Personnel and maintenance contractors who handle hazardous materials must be aware of the potential

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risks, the appropriate ways to handle the equipment to prevent breakage or spillage, and the response in the event of a spill.

### **Transportation of Dangerous Goods Act and Regulations**

The *Transportation of Dangerous Goods Act* and its regulations establish the requirements for the transportation of dangerous goods in Canada. The *Transportation of Dangerous Goods Regulations* (“TDGR”) establish a classification system for dangerous goods according to their physical and/or chemical properties, and establish specific requirements for the handling and transportation of dangerous goods and hazardous materials, including manifesting requirements.

TDGR requirements apply to shippers, carriers, and receivers of dangerous goods. The classification system is described in Schedule 1 of TDGR. All of these items need to be controlled during transportation, with different controls in place depending on the method – rail, road, marine or air. Nova Scotia’s *Transportation of Dangerous Goods Act* adopts the federal TDG regulations. Transportation of hazardous materials outside of DFO facilities (on public roads, or by air or sea) will be governed by the *Transportation of Dangerous Goods Act* and its regulations.

### **Canada Occupational Health and Safety Regulations**

The *Canada Occupational Health and Safety Regulations* (“COHS”) establish the levels of occupational exposure in the federal work environment for most of hazardous airborne chemical agents. The occupational exposure to hazardous substances is to be no higher than the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs).

### **The National Fire Code of Canada**

The *National Fire Code of Canada* identifies requirements for storage and handling, use and processing of flammable liquids and combustible liquids in buildings, structures and open areas. It establishes design standards and requirements for the storage of flammable or combustible liquids, with the goal of preventing fires. The National Fire Code also requires a spill of flammable liquids or combustible liquids, including water used for fire fighting purposes, to be prevented from flowing outside of the spill area and from reaching waterways, sewer systems and potable water sources.

### **Nuclear Safety and Control Act**

Radioactive materials must be stored, handled and disposed of in accordance with the Nuclear Safety and Control Act. Nuclear licenses must be obtained for any radioisotope-containing equipment (*e.g.*, density meters, scanners) under the Act.

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## **Explosives Act**

The Explosives Act was promulgated in 1985 to control the manufacture, testing, sale, storage, transportation and importation of explosives and the use of fireworks in Canada. The Act gives the government of Canada the authority to enact regulations to classify explosives, to restrict the sale and use of explosives, to prescribe conditions for the transportation of explosives; to define safety standards.

The Act prohibits the following activities:

- making or manufacturing explosives either wholly or in part except in a licensed factory;
- selling any authorized explosive unless that person is the operator of a licensed factory or licensed magazine and is authorized to sell explosives;
- storing any explosive in a magazine that is not a licensed magazine;
- breaking up or unmaking, any explosive, making fit for use any damaged explosive, or remaking, altering or repairing any explosive except in a licensed factory

## **Explosives Regulations**

These regulations were promulgated under the Explosives Act to ensure the safe storage and transportation of the seven different classes of explosives. The characteristics of the classes are specified in the regulations and include: Class 1- Gunpowder; Class 2 - Nitrate Mixture; Class 3 - Nitro-compound; Class 4 - Chlorate Mixture; Class 5 - Fulminate; Class 6 - Ammunition, and Class 7 - Fireworks. The conditions under which explosives are to be stored in magazines are explained and the materials which should not be stored with (or in close proximity to) explosives are listed. Restrictions on the sale of explosives are also presented. Flares are classified as explosives and would have to be managed in conformance with these regulations if they are transported to, stored or used at the site.

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## **OTHER RELEVANT FEDERAL REQUIREMENTS**

### **Canadian Environmental Quality Guidelines**

In 1999, the Canadian Council of Ministers of the Environment (CCME) adopted the *Canadian Environmental Quality Guidelines*, which are enacted under Section 54 of CEPA. These guidelines are intended to integrate national environmental quality guidelines for all environmental media including water (drinking water, recreational water, water for aquatic life, irrigation water, and livestock water), soil (agricultural, residential/parkland, commercial, and industrial land uses), sediment, tissue residue (for wildlife consumers of aquatic biota), and ambient air quality (for human health, vegetation, animals, material, and aesthetic atmospheric properties).

### **CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products**

In 2003, the Canadian Council of Minister of the Environment developed the “Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products”. The Code of Practice presents the minimum requirements to protect the environment from impacts resulting from existing, new or proposed aboveground and underground storage tank systems that contain petroleum products and allied petroleum products. The primary purpose of the Code of Practice is the promotion of environmentally sound management of storage tank systems through the application of uniform performance standards throughout Canada.

Other federal documents applicable to the storage and handling of petroleum products on federal (and provincial property) include:

- CAN/CSA-B139 Installation Code for Oil Burning Equipment (2004)
- CAN/CSA-282-00 Emergency Electrical Power Supply for Buildings (2000)
- The National Fire Code of Canada (2010)

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## **PROVINCIAL LEGISLATION**

The provincial acts and regulations identified below are presented for information purposes. They would not normally apply at the facility; however they are referenced as they may provide insight into Best Management Practices especially in areas where there is no comparable federal requirements (e.g. Dangerous Goods Management, Used Oil Management; Solid Waste Management).

### **Nova Scotia Environment Act**

The Nova Scotia *Environment Act* is the main regulatory tool in Nova Scotia to protect the province's environment. The Act establishes a general prohibition on the release of contaminants without an Approval, and the release must be in accordance with the Regulations under the Act. A number of regulations are enacted under the Act relating specifically to the management of hazardous materials. These are summarized below.

### **Dangerous Goods Management Regulations**

The Nova Scotia *Dangerous Goods Management Regulations* include requirements for the storage of dangerous goods and waste dangerous goods. To comply with these regulations, facilities in Nova Scotia must:

- store products in legibly and indelibly labeled container made of compatible material;
- ensure that portable containers meet TDG requirements;
- design and maintain storage facilities to be:
  - secured from public entry;
  - prominently identified as a dangerous goods or waste dangerous goods storage facility using TDG placards;
  - equipped with suitable emergency response equipment;
  - staffed with employees trained in emergency response; and
  - secured to prevent spilled or leaked dangerous goods or waste dangerous goods from entering the environment or causing an adverse effect;
- ensure that waste dangerous goods are not diluted or adulterated (e.g. mixed with inert material to dispose of as a regular waste) without authorization; and
- prevent unauthorized dumping, depositing, dropping, throwing, discharging or leaving of dangerous goods or waste dangerous goods in a manner which may cause an adverse effect.

### **Emergency Spill Regulations**

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The *Emergency Spill Regulations* establish the specific regulatory reporting and training procedures for emergency spills into the environment of designated chemicals, including: explosives; flammable, non-flammable, toxic, and/or corrosive compressed gases; flammable solids; flammable liquids; spontaneous combustible solids; water reactant solids; oxidizing substances; organic peroxides; poisonous, infectious, radioactive, and/or corrosive substances; PCB mixtures; environmentally hazardous substances; dangerous wastes; asbestos waste; used oil and contaminated used oil; pesticides; sewage; and ozone depleting substances.

Specific reporting thresholds for spills or unauthorized releases of each of these substances (classified according to TDG classifications) are identified in Schedule A of the Regulations. Immediate verbal reports are required to Nova Scotia Environment as well as the Canadian Coast Guard, followed by written reports within a specified time period. Training requirements for emergency responders are also outlined in the Regulations.

### **Petroleum Management Regulations**

The *Petroleum Management Regulations* establish the specific requirements for petroleum storage systems in Nova Scotia. Petroleum product is defined as essentially any liquid hydrocarbon. The Regulation establishes licensing requirements for petroleum storage facilities or systems, design standards for new petroleum storage systems, environmental approval requirements for new facilities, licensing and liability insurance requirements, testing and monitoring requirements for installed systems, and a variety of other requirements aimed at preventing petroleum spills from storage systems.

### **PCB Management Regulations**

The *PCB Management Regulations* establish the specific storage, handling, labeling, training, and disposal requirements for PCB wastes and PCB-containing equipment in Nova Scotia. These regulations largely mirror the requirements of the federal *PCB Regulations* under CEPA, with specific emphasis on storage requirements, limiting access, labeling, and fire protection and emergency procedures. Specific inspection and maintenance requirements are established, as well as record keeping and reporting requirements.

### **Used Oil Regulations**

The *Used Oil Regulations* establish the requirements for the management and disposal of waste oil in the province. The Regulations apply mainly to those individuals or companies involved in the transportation, collection, recycling, storage or sale of used oil. The Regulations establish limitations on the sale or use of used oil, requires approvals to be obtained for used oil collectors or recyclers, establishes storage requirements, prohibits the deliberate contamination of used oil and the sale or use of

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contaminated used oil, and requires that used oil be returned to an approved return facility. The use of used oil as a fuel is generally prohibited with some exceptions.

### **Asbestos**

In Nova Scotia, asbestos is regulated by regulations and guidelines made under the Occupational Health and Safety Act. They are:

- Asbestos Waste Management Regulations N.S. Reg. 53/95;
- Code of Practice for Removal of Friable Asbestos Containing Materials (March 2003);
- Code of Practice for Managing Asbestos in Buildings (March 1998);
- Guidelines for Outdoor Work with Asbestos (Removal Projects) (March 1998); and
- Guidelines for Maintenance Operations Involving Asbestos (March 1998).

In addition to the provincial requirements, a number of federal departmental directives and guidelines have been adopted for the protection of occupants from asbestos exposure. One of these documents is the Treasury Board of Canada Secretariat Hazardous Substances Directive – II, Section 2.9, as it relates to asbestos management. Another such directive is the Public Works and Government Services Canada Deputy Minister Directive (DIR:057) – Asbestos Management - *respecting asbestos management in federally owned or leased buildings or facilities containing asbestos*, March 12, 1997.

An Asbestos Management Plan is a regulatory requirement in Nova Scotia, under the Code of Practice for Managing Asbestos in Buildings, Section 3. An active AMP is an excellent means to ensure that all of the requirements of the Nova Scotia Regulations and Treasury Board of Canada Circular TB 774012 are met, and to prevent exposure of building occupants to asbestos fibres.

### **Solid-Waste Resource Management Regulations**

The *Solid-Waste Resource Management Regulations* establish the requirements for the proper management, reuse, recycling, and disposal of solid wastes. These include provisions with respect to general solid waste, beverage containers, composting facilities, management of used tires, and construction and demolition debris, among others.

### **Occupational Health and Safety Act**

The *Occupational Health and Safety Act* establishes a Workplace Hazardous Materials Information System (WHMIS) and requirements for labeling, employee awareness, and the provision of Material Safety Data Sheets (MSDSs). To the extent that Her Majesty in right of Canada submits, this Act binds



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Her Majesty in right of Canada, every agency of the Government of Canada and every other person whose workplace health and safety standards are ordinarily within the legislative jurisdiction of the Parliament of Canada. 1996, c. 7, s. 4. All sites which have chemical products should have updated MSDSs in place and accessible in the workplace. The requirements of the *Occupational Health and Safety Act* and regulations are similar to the requirements of the *Canada Labour Code, Part II*.

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## **APPENDIX C – REGIONAL SOP FOR MANAGING HAZARDOUS MATERIALS**



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## REVISION HISTORY

REVISION NUMBER	REVISION DATE	NATURE OF REVISION	APPROVAL
0	Initial Issue – October 2010		
1	September 2012	Updates to Technical Requirements	Diane Tremblay, Manager, Environmental Management



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## 1.0 TITLE

ENV SOP 2 – Storage of Hazardous Materials

## 2.0 PURPOSE

The purpose of this procedure is to document the requirements for the safe and environmentally acceptable management of hazardous materials in facilities occupied by staff in the Maritimes and Gulf Regions of Fisheries and Oceans Canada (DFO). For the purposes of this procedure, the term ‘Hazardous Materials’ refers to both chemicals in use and those in storage as waste.

## 3.0 SCOPE

This procedure applies to employees of DFO in the Maritimes and Gulf Regions who handle hazardous materials in the course of their professional activities. For the purpose of this procedure, the following definitions apply.

## 4.0 DEFINITIONS

Dangerous Good

*a product, substance or organism which is an explosive, a compressed gas, a flammable liquid, a flammable solid, an oxidizing substance, an organic peroxide, a poisonous or infectious substance, a radioactive material, a corrosive substance or a miscellaneous material which poses a danger to life, health, property or the environment. Regulated Dangerous Goods are listed in the Transportation of Dangerous Goods Regulations*

Hazardous Material

*a material that possesses a characteristic which is hazardous to the safety or health of a person exposed to it. Includes Hazardous Substances, Controlled Products, Hazardous Products, Dangerous Goods and Hazardous Waste*

Hazardous Substance

*controlled product and a chemical, biological or physical agent that, by reason of a property that the agent possesses, is hazardous to the safety or health of a person exposed to it*



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#### Controlled Product or Hazardous Product

*any product, material or substance specified by regulation to be included in one of these classes Class A - Compressed Gas; Class B - Flammable and Combustible Material; Class C - Oxidizing Material; Class D - Poisonous and Infectious Material; Class E - Corrosive Material; Class F - Dangerously Reactive Material*

#### Hazardous Waste/Waste Hazardous Material

*a controlled product (compressed gas, flammable or combustible material, oxidizing material, poisonous or infectious material, corrosive material or dangerously reactive material) destined for disposal, recycling or recovery*

#### WHMIS

*Workplace Hazardous Materials Information System – a provincial regulation dealing with employee education, labeling requirements and Material Safety Data Sheets for hazardous materials in the workplace*

## 5.0 REGULATORY CONSIDERATIONS

There are a number of Codes, Acts and Regulations which are not specifically related to environmental protection. However, if effectively implemented, the storage and handling of hazardous materials provisions of these documents do serve to reduce the risk (both environmental and health and safety) of handling hazardous materials. Important examples of the above are summarized in this section.

### 5.1 The Canada Labour Code, Part II

The Canada Labour Code, Part II is enabling legislation which prescribes the requirements for safety in the workplace and specifies that hazardous substances must be stored and handled so as to minimize the risk of injury or ill health to workers. It requires the identification of hazardous substances and the provision of Material Safety Data Sheets to workers.



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### 5.1.1 The Canada Occupational Health and Safety Regulations

Part X of the Canada Occupational Health and Safety Regulations deals with hazardous substances, and specifies clear requirements relating to hazardous substances in the workplace.

Where hazardous substances are present in the workplace, the employer must:

- Develop and maintain a record of hazardous substances used, produced, handled and/or stored for use in the workplace
- Conduct a hazard investigation if an employee is endangered by exposure to a hazardous substance
- Educate employees with respect to hazard prevention and control
- Provide copies of up-to-date Material Safety Data Sheets for hazardous substances

There are a number of other requirements as well, related to containers, labels, signs, and other hazard controls.

## 5.2 the National Fire Code of Canada

### Part 3

Part 3 of the National Fire Code of Canada (NFCC) deals with the indoor and outdoor storage of combustible products and dangerous goods. It contains specifications for:

- packages and containers for dangerous goods
- labeling
- housekeeping in areas where dangerous goods are stored
- separation distances for storage of dangerous goods based on chemical compatibilities
- spill controls inside and outside
- training for employees

### Part 4

Part 4 of the NFCC deals with indoor and outdoor storage of flammable and combustible liquids. It contains specifications for:

- preventing and responding to spills and leaks
- containers and storage cabinets for flammable liquids and combustible liquids
- labels and placards in storage areas



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- separation distances from other dangerous goods

### 5.3 Provincial workplace Hazardous Materials Information System (WHMIS) Regulations

WHMIS is implemented through coordinated federal, provincial and territorial legislation. Supplier labelling and MSDS requirements are set out under the *Hazardous Products Act* and associated *Controlled Products Regulations*. The *Hazardous Products Act* and its regulations are administered by the Government of Canada Department of Health, commonly referred to as Health Canada.

The *Controlled Products Regulations* establish a **national** standard for the classification of hazardous workplace materials. In addition to setting out criteria for biohazards, chemical and acute hazards, the regulations specify criteria for chronic health hazards including mutagenicity, carcinogenicity, embryo and reproductive toxicity, respiratory tract and skin sensitization.

Each of the thirteen provincial, territorial and federal agencies responsible for occupational safety and health have established employer WHMIS requirements within their respective jurisdiction. These requirements place an onus on employers to ensure that controlled products used, stored, handled or disposed of in the workplace are properly labelled, MSDSs are made available to workers, and workers receive education and training to ensure the safe storage, handling and use of controlled products in the workplace.

## 6.0 HAZARDS ASSOCIATED WITH IMPROPER STORAGE OF HAZARDOUS MATERIALS

Improper storage of hazardous materials can result in a number of serious workplace hazards, including:

- Inhalation of gases, vapours and particulate material (e.g. mists, dusts, smoke, fumes)
- Absorption through skin of liquids, solids, gases and vapours
- Ingestion of chemicals directly or indirectly via contaminated foods and beverages and contact between mouth and contaminated hands (e.g. nail-biting, smoking)
- Injection of chemicals through needles and other contaminated laboratory sharps

As well, if hazardous materials are improperly stored there is a danger of accidental spillage, and there may be immediate, acute hazards resulting from contact with the material. These could include:





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- burns from corrosive materials; injury or ill health related to inhalation of toxic fumes; physical injury resulting from exploding containers; rashes or respiratory distress, convulsions or possibly even death as a result of over-exposure to spilled / released hazardous materials.
- dangerous, uncontrolled chemical reactions between chemicals, and risks of exposure to employees
- regulatory non-conformities (based on the nature of the material stored), and could result in government enforcement actions

## 7.0 RECOMMENDED HANDLING PRACTICES

The following sections deal with recommended handling practices for hazardous materials. They relate to regulatory requirements and to Best Management Practices but are **not** comprehensive. Detailed instructions on handling and storage for individual chemicals documented in Material Safety Data Sheets should always be consulted if there is any question regarding safe handling or storage requirements.

### 7.1 Labels

Hazardous materials in the workplace should be identified with a label which contains the following information:

- The name of the product (the product identifier)
- Information on the safe handling of the product
- A statement indicating that an MSDS is available

#### 7.1.1. Hazard Symbols

Information on the safe handling of the product is most effectively conveyed using one of a number of different (and acceptable) hazard identification systems (e.g. the WHMIS symbols or the NFPA Rating System). The rules for communicating health and safety information on labels and MSDSs are changing with the introduction of a Globally Harmonized System (GHS). The goal of GHS is a common format and content for labels and MSDSs which will be adopted internationally in the future. Under the GHS, MSDSs will be called simply Safety Data Sheets.






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One (or more depending on the hazards of the material) of the following Hazard Symbols could be included on a Workplace Label:






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CLASS	SYMBOL	WHAT'S INCLUDED	WHEN TO USE (CONSULT MSDS)
Class A – Compressed Gases		This class includes compressed gases, dissolved gases, and gases liquefied by compression or refrigeration. Example: oxygen and propane	When the Gas inside the cylinder is under pressure and when the cylinder may explode if heated or damaged
Class B – Flammable and Combustible Materials		This class includes solids, liquids, and gases capable of catching fire in the presence of a spark or open flame under normal working conditions. Example: propane and gasoline	When the material may burn or explode when exposed to heat, sparks or flames. Flammable materials burn readily at room temperature; combustible materials burn when heated
Class C – Oxidizing Materials		These materials increase the risk of fire if they come in contact with flammable or combustible materials. Example: oxygen	When the material can cause other materials to burn or explode by providing oxygen or when the materials may burn skin and eyes on contact





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CLASS	SYMBOL	WHAT'S INCLUDED	WHEN TO USE (CONSULT MSDS)
Class D - Poisonous and Infectious Materials  Division 1 Materials Causing Immediate and Serious Toxic Effects		These materials can cause death or immediate injury when a person is exposed to small amounts. Example: sodium cyanide, hydrogen sulphide	When the materials may cause immediate death or serious injury if inhaled, swallowed, or absorbed through the skin
Class D – Poisonous and Infectious Materials  Division 2 Materials Causing Other Toxic Effects		These materials can cause life-threatening and serious long-term health problems as well as less severe but immediate reactions in a person who is repeatedly exposed to small amounts. Example: fiberglass insulation	When the material may cause death or permanent injury following repeated or long-term exposure; when it may irritate eyes, skin and breathing passages; when it may lead to chronic lung problems and skin sensitivity; when it may cause liver or kidney damage, cancer, birth defects or sterility
Class D – Poisonous and Infectious Materials  Biohazardous Infectious Material		These materials contain an organism that has been shown to cause disease or to be a probable cause of disease in persons or animals. Example: Anthrax	When contact with microbiological agents (e.g., bacteria, viruses, fungi and their toxins) may cause illness or death



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CLASS	SYMBOL	WHAT'S INCLUDED	WHEN TO USE (CONSULT MSDS)
Class E – Corrosive Materials		This class includes caustic and acid materials that can destroy the skin or eat through metals. Examples: battery acid, sodium hydroxide, hydrochloric acid, nitric acid	When the material could burn eyes and skin on contact or burn tissues of respiratory tract if inhaled
Class F – Dangerously Reactive Materials		These products may self-react dangerously (for example, they may explode) upon standing or when exposed to physical shock or to increased pressure or temperature, or they emit toxic gases when exposed to water. Example: nitroglycerin	When the material may be unstable and react dangerously to jarring, compression, heat or exposure to light; or may burn, explode or produce dangerous gases when mixed with incompatible materials

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### 7.1.1.1 Sample WHMIS Labels

If the hazardous material is in its original package the Supplier Label will usually display the required information, as described in the example below.

#### Supplier Label

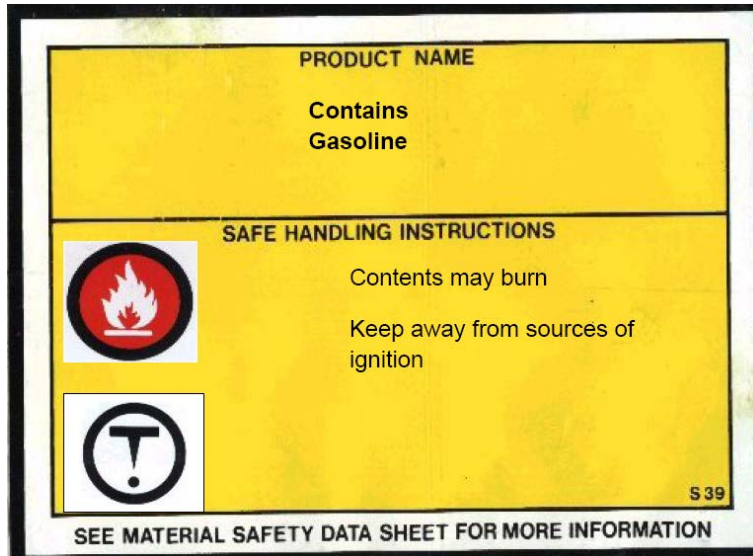
<b>TOLUENE SULPHONIC ACID 70%, LIQUID</b> <b>ACIDE SULFONIQUE TOLUÈNE À 70%, LIQUIDE</b>	
<b>RISK PHRASE(S)</b> Highly irritating to skin, eyes and nose. <b>HEALTH HAZARD DATA:</b> Strong Acid: Treat as per sulphuric acid. <b>EFFECTS OF OVEREXPOSURE: ACUTE</b> OVEREXPOSURE: Skin and eye. <b>PRECAUTIONARY MEASURES</b> <b>SPECIFIC PERSONAL PROTECTIVE EQUIPMENT</b> <b>EYE:</b> Face shield and goggles. <b>GLOVES:</b> Rubber. <b>OTHER CLOTHING AND EQUIPMENT:</b> Rubber apron, rubber boots. <b>FIRST AID MEASURES:</b> <b>EYES:</b> Flush with copious quantities of water for 15 minutes. Consult physician. <b>SKIN:</b> Flush with water as per sulphuric acid. <b>INGESTION:</b> Treat as per sulphuric acid. Consult physician.	  <b>RISQUE(S) POSSIBLE(S)</b> Extrêmement irritant pour la peau, les yeux et le nez. <b>RENSEIGNEMENTS SUR LES DANGERS POUR LA SANTÉ</b> Acide fort: Traiter comme pour l'acide sulfurique. <b>EFFETS D'UNE SUREXPOSITION</b> SUREXPOSITION AIGUË: Peau et yeux. <b>MESURES DE PRÉCAUTION</b> <b>ÉQUIPEMENT DE PROTECTION SPÉCIFIQUE:</b> <b>YEUX:</b> Écran facial et lunettes <b>GANTS:</b> En caoutchouc. <b>AUTRES VÊTEMENTS ET ÉQUIPEMENT:</b> Tablier en caoutchouc; bottes en caoutchouc. <b>PREMIERS SOINS:</b> <b>YEUX:</b> Bien rincer à grande eau pendant 15 minutes. Consulter un médecin. <b>PEAU:</b> Rincer à l'eau comme pour l'acide sulfurique. <b>INGESTION:</b> Traiter comme pour l'acide sulfurique. Consulter un médecin.
<b>REFER TO MATERIAL SAFETY DATA SHEET FOR FURTHER INFORMATION</b> <b>POUR PLUS D'INFORMATIONS, CONSULTER LA FICHE SIGNALÉTIQUE</b>	
Henkel Canada Ltd. 162 Ward Ave., Hamilton, Ontario L8N 3M8 (416)525-4660	

If the hazardous material has been decanted to another container or if the original Supplier Label is illegible or damaged, a Workplace Label must be used. The requirements for Workplace Labels are less stringent but should contain the three basic elements (product identifier, information on safe handling and a statement regarding the MSDS). This is shown in the example below:



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### Workplace Label (for a Container of Gasoline)

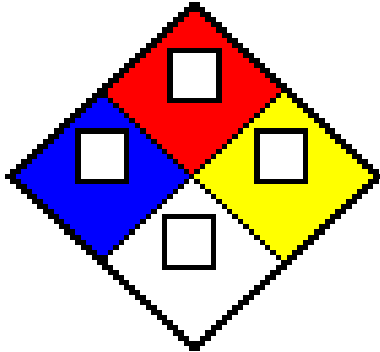


### 7.1.2 NFPA Symbols

In the United States the hazard system specified in the National Fire Code is commonly used on Workplace Labels. The system is commonly used in Canada as well, and is an effective communication of workplace hazards. The hazard identification symbol is a color-coded array of four numbers or letters arranged in a diamond shape as shown below.



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#### NFPA Hazard Rating System

- **Health Hazard (blue section)**
- **Flammability (red section)**
- **Reactivity (yellow section)**
- **Other Hazard Information (white section)**

Each category is divided into five levels of hazard potential with

- **zero (0)** used to indicate no special hazards and
- **four (4)** for severe or extreme hazard potential.

These labels are commonly used in Canada and serve well to identify the inherent hazards of a material. They are acceptable for use on Workplace Labels provided the other required information (product identifier and MSDS statement) are also present.

## 7.2 Other Signage







Individual storage areas (e.g. rooms or containers) used for storing hazardous materials should be identified through the use of a Placard conforming to the Transportation of Dangerous Goods Regulations. Where the storage area is used for more than one class of Dangerous Goods, a Danger Placard may be displayed. Examples of various Placards are shown below.

WHEN THIS CLASS OF DANGEROUS GOOD IS STORED	DISPLAY THIS PLACARD
Class 1 – Explosive (e.g. Flares, Fireworks)	







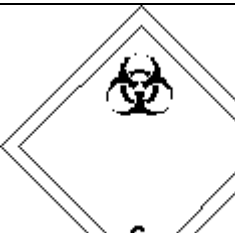


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WHEN THIS CLASS OF DANGEROUS GOOD IS STORED	DISPLAY THIS PLACARD
Class 2.1 – Flammable Gas	
Class 2.2 – Non flammable, Non toxic Gas	
Class 2.3 – Toxic Gas	
Class 3 – Flammable Liquid	
Class 4.1 – Flammable Solids	
Class 4.2 - Substances Liable to Spontaneous Combustion	







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WHEN THIS CLASS OF DANGEROUS GOOD IS STORED	DISPLAY THIS PLACARD
Class 4.3 - Water Reactive Substances	
Class 5.1 – Oxidizing Substances	
Class 5.2 – Organic Peroxides	
Class 6.1 – Toxic Substances	
Class 6.2 – Infectious Substances	



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WHEN THIS CLASS OF DANGEROUS GOOD IS STORED	DISPLAY THIS PLACARD
Class 7 – Radioactive Materials	
Class 8 - Corrosives	
Class 9 – Miscellaneous Products, Substances or Organisms	
Where more than one Class of Dangerous Goods are stored	

### 7.3 Control of Liquid releases

Whenever liquid hazardous materials are stored, adequate measures must be taken to ensure that any leaks or spills can be effectively cleaned up. This can be accomplished in a number of acceptable ways:

- Keep lids on containers tightly closed when material is not in use



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- Ensure ample space is available in areas where hazardous materials are used and stored to prevent risk of spillage or knocking over containers
- Provide secondary containment trays or pallets for containers of liquid hazardous materials. Use information on the chemical resistance qualities of the trays or pallets when determining the type of containment tray to be used. For example, aluminum trays do not offer good resistance to spills of corrosive chemicals such as acids and alkalis
- Construct a barrier around the storage area where liquid hazardous materials are stored which is capable of containing a spill. Again, the material used to construct the barrier should offer effective containment of the particular hazardous material(s) stored
- Grade the area (or slope the floor) where the liquid hazardous materials are stored in order to divert any spilled liquids to a contained collection area
- Provide adequate and appropriate spill response equipment in all areas where hazardous materials are stored

## 7.4 Special Storage Requirements for Particular Hazardous Materials

Some Hazardous Materials require special storage arrangements and these should be considered when designing storage areas. For example:

Compressed Gases:

- Store cylinders of compressed gases in a clearly identified, dry, well-ventilated storage area away from doorways, aisles, elevators, and stairs. Storage areas should be located away from sources of ignition or heat.
- Protect cylinders of compressed gases from mechanical damage using suitable racks, straps, chains or stands
- Store cylinders of flammable gases outdoors, supported on raised concrete or other noncombustible platforms in an area enclosed by a fence which can be locked. If stored indoors, the storage area should meet the requirements of Section 3.2.8.2 of the NFCC



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#### Flammable Liquids:

- Containers of flammable liquids should meet NFCC requirements and should be stored inside approved Flammable Liquids Cabinets (Note: ‘approved’ means conforming to Section 4.2.10 of the NFCC)

#### Reactive Substances:

- Reactive substances should be stored in a location and in a manner that will prevent any undesired reactions (e.g. water reactive substances should be stored in sealed containers in a dry location). The MSDS should be reviewed for any special storage requirements
- Oxidizing substances should not be stored on combustible floors or platforms

## 7.5 Administrative Considerations

The following administrative items should be considered at facilities where hazardous materials are used and / or stored:

- Prepare an inventory of hazardous materials in use and in storage
- Provide up-to-date Material Safety Data Sheets for hazardous materials in the workplace
- Train personnel at the facility who use hazardous materials in safe storage and handling procedures and appropriate emergency response procedures, and the records of such training should be kept
- Practice “Just in Time” purchasing as much as possible to avoid having stockpiles of hazardous materials which take up storage space
- Dispose of time-expired products because the integrity of containers may be compromised, for example:
  - bleach – 2 years from date of purchase
  - cleaning chemicals – 3 years from date of purchase
  - paint products – 3 years from date of purchase or if they have been exposed to freezing temperatures
  - hydrocarbon products – 5 years from date of purchase



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- compressed gas cylinders – in accordance with the hydrostatic test date
  - other hazardous materials – in accordance with product expiration date
- Conduct regular inspections of areas where hazardous materials are stored. Note and correct any of the following unusual conditions:
  - improper storage of chemicals
  - leaking or deteriorating containers
  - spilled chemicals
  - temperature extremes (too hot or too cold in the storage area)
  - lack of or low lighting levels
  - blocked exits or aisles
  - trash accumulation
  - evidence of smoking
  - blocked, broken or missing fire extinguisher(s)
  - lack of warning signs ( e.g. "No Smoking", "Flammable Liquids", "Acids", "Corrosives", "Poisons", "Chemical Storage")

## 7.6 Compatibility Considerations

Some hazardous materials are subject to dangerous reactions if they come into contact with other hazardous materials. Mixing incompatible materials may result in the evolution of heat; the generation of pressure; fire or explosion; violent reaction; generation of toxic dusts, mists, vapors, or gases. Therefore, hazardous materials should be stored based on their chemical compatibilities, and adequate separation should be provided for those which are not compatible. A Chemical Compatibility Chart (adapted from the TDGR) is presented below. It provides basic direction on hazardous materials which should not be stored together, but is **not** an exhaustive reference. The MSDS should always be consulted for specific direction on storage requirements and possible incompatibilities.



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### Legend to the Compatibility Chart

- Materials are not compatible. Do not store together

- Materials are compatible. May store together

- Materials are not compatible. Separate by a minimum of 1 meter horizontal distance

- Refer to the MSDS (\*)

It is good practice to always refer to the MSDS

Class												

Chemical Compatibility Chart  
(adapted from the Transportation of Dangerous Goods Regulations)



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## 7.7 Housekeeping in Storage Areas

In areas where hazardous materials are stored it is important to implement good “housekeeping” practices, for example:

- Provide and maintain aisles / walkways to allow unobstructed access to stored materials
- Ensure rooms inside buildings used for the storage of hazardous materials are dry, cool and well ventilated
- Remove waste packaging materials and other debris from areas where hazardous materials are stored
- Clean up any spilled product in storage areas
- Move broken containers to a secure location and repackage or dispose of the contents
- Take measures to prevent corrosion or deterioration of shelving or racks where hazardous materials are stored
- Ensure floors of hazardous material storage areas are constructed of (or coated with) impermeable materials to prevent absorption of any spilled materials

## 7.8 Basic Storage Recommendations

In areas where hazardous materials are stored there are some general recommendations which, if implemented, will minimize the risks of spillage and aid in maintaining a safe workplace. These include:

- Ensure that containers for hazardous materials are compatible with the material contained and are durable
- Keep hazardous materials (except cylinders of compressed gas) at least 100 mm off the floor
- Do not store hazardous materials above eye level if possible
- Store larger containers on lower shelves (if a shelving unit is used)
- Ensure shelves where hazardous materials are stored have lips or other restraints to prevent spillage





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- Avoid overcrowding in storage areas and do not store containers in out-of-the-way locations where they could be forgotten
- Store containers away from doors because even though it may be convenient to place frequently used materials next to the door, they could hinder an escape route if an emergency occurs
- Store containers in well ventilated areas to ensure the removal of any toxic or flammable vapours
- Use caution when transferring hazardous materials from one container to another to avoid spilling material
- Inspect containers of hazardous materials for damage or leaks before handling them

## 8.0 STORAGE OF HAZARDOUS MATERIALS IN SHIPPING CONTAINERS

Generally, it is not recommended that hazardous materials be stored in shipping containers, especially if there are other, non-hazardous materials in the container. Storage in a shipping container is acceptable in some situations, e.g. where the shipping container is a dedicated unit (e.g. storage container for waste batteries), or where the hazardous materials are stored inside an approved storage cabinet (e.g. a Flammable Liquids cabinet). If Hazardous Materials are to be stored in a Shipping Container the basic storage recommendations (Section 7.8) should be followed.

## 9.0 MANAGEMENT OF WASTE HAZARDOUS MATERIALS

Waste hazardous materials must be regularly collected and appropriately disposed of (in a timely manner) in conformity with applicable environmental requirements (e.g. proper labeling; use of licensed waste contractors; completion of manifests where the waste is to be transported out of province).



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## 9.1 Minimizing Waste Generation

Minimizing the amount of waste hazardous materials which is generated should be a high priority and the following actions should be instituted:

- Develop an inventory of chemicals no longer needed in each work area that could possibly be used by someone else
- Where possible, substitute less toxic chemicals when toxic chemicals are used in a procedure or process
- Evaluate ways to reduce the amount of toxic chemicals used in work areas
- Explore methods to re-use or recycle spent solvents, unused paints, cleaners, and other chemicals.
- Avoid contaminating non-hazardous waste streams with hazardous, radioactive or biohazardous material.

## 9.2 Handling and Storage

Handling and storage of hazardous wastes requires the same due diligence as handling of hazardous materials with respect to labels and placards, spill control, compatibility and housekeeping. With respect to labels, even though WHMIS does not apply to hazardous waste the Workplace WHMIS Labels are acceptable for wastes based on the hazard characteristics and provided that the word “Waste” is included in the Product Identifier. Unidentified materials will pose a problem – however, a licensed waste disposal company can provide appropriate advice and conduct the required testing to determine the nature of the waste and recommend the necessary labeling.

Hazardous wastes should be collected in a central storage facility which meets the same stringent requirements as storage areas for hazardous materials described in Section 7.0. Particular attention should be paid to the maintenance of inventory records, the requirement for a Placard



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on the door indicating that Waste Hazardous Materials are stored inside, and the need to train staff in handling and emergency response procedures.

### 9.3 Specific Instructions for Waste Containers

The following specific instructions with respect to containers of waste hazardous materials should be followed:

- Containers must be kept closed except when adding or removing wastes
- Containers should be kept clean with no visible contamination on the outside of the container
- Markings or labels on the container must be legible
- Areas where waste chemicals are accumulated must have secondary containment sufficient to collect incidental spills that might occur when adding waste to containers
- Containers should not be overfilled. "Full containers" should have at least a 10% head space to allow for expansion

### 9.4 Specific Instructions for Particular Wastes

The following specific instructions should be followed for the listed hazardous waste:

#### Ink and Toner Cartridges

Ink and toner cartridges can often be sent back to the manufacturer for recycling using prepaid postage. Cartridge packages or the company website should be checked for more information. Ink cartridges can be placed in collection boxes where they are provided in some facilities. Where possible, recycled cartridges should be requested when making purchases. They are generally cheaper and of good quality.

#### Batteries

The following types of rechargeable batteries should be placed in collection boxes for recycling: Nickel Cadmium



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(Ni-Cd), Nickel- Metal Hydride (Ni-MH); Lithium Ion (Li-ion); Small Sealed Lead (Pb).

## 10.0 RELATED DOCUMENTATION

1. Transportation of Dangerous Goods Regulations ([Link to TDG Regulations](#))
2. Canada Labour Code ([Link to Canada Labour Code](#))
3. Canada Occupational Health and Safety Regulations ([Link to Canada OH&S Regulations](#))
4. Nova Scotia Workplace Hazardous Materials Information System (WHMIS) Regulations ([Link to Nova Scotia WHMIS Regulations](#))
5. Part 3 and Part 4 of the National Fire Code of Canada
6. BIO Chemical Management Policy

<i>Hazardous Materials Environmental Management Plan – Bedford Institute of Oceanography</i>		
<i>Prepared by: Environmental Officer, RPSS</i>	<i>Approved by: Manager, Environmental Management</i>	
<i>Issue Date: March 2008</i>	<i>Revision #: 1</i>	<i>Revision Date: September 2012</i>

## **APPENDIX D** **ENVIRONMENTAL INCIDENT REPORT**

<b><i>Hazardous Materials Environmental Management Plan – Bedford Institute of Oceanography</i></b>		
<b><i>Prepared by: Environmental Officer, RPSS</i></b>	<b><i>Approved by: Manager, Environmental Management</i></b>	
<b><i>Issue Date: March 2008</i></b>	<b><i>Revision #: 1</i></b>	<b><i>Revision Date: September 2012</i></b>

In the event of a hazardous material incident, the Property Manager is responsible for completing and submitting an Environmental Incident Report.

<b>Environmental Incident Report Reporting Requirements for a Hazardous Material Incident</b>		
<b>Responsibility:</b>	<b>Timing:</b>	<b>Distribution:</b>
Property Manager (PWGSC)	Within 24 hours of an incident (ie. spill, leak or release)	<ul style="list-style-type: none"> <li>• Facility Director</li> <li>• Director of Real Property</li> <li>• EMS Coordinator</li> </ul>

<b>Hazardous Materials Environmental Management Plan – Bedford Institute of Oceanography</b>		
<b>Prepared by: Environmental Officer, RPSS</b>		<b>Approved by: Manager, Environmental Management</b>
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Report number	<b>ENVIRONMENTAL INCIDENT REPORT</b>	
1.- Date of incident : (dd/mm/yy)	2.- Hour of incident :	12.- Describe what was done to reduce the impact of the incident (shut off valves, built dam, etc.):
3.- Discovered by :		
4.- Who was it reported to :		
5.- Nature of incident : (Spill, leak, fire, explosion, other (explain))		
6.- Was anyone injured?		13.- What products and equipment were used (Neutralizing agents, absorbents, sand, extinguishers, backhoe, cranes, etc.)
7.- Where did it happen (be precise) :		
8.- Materials involved : (Acids, bases, solvents, gases, paints,)		
9.- Approximate quantities involved and nature of containers if any :		
10.- Affected media (Soil, water, air, sewers) and approximate size of affected area :		EMS Coordinator review (sections 14-19)
11.- Report completed by (Sections 1-13) Name :		14.- What other work is needed in order to completely restore the site?
Signature :		15.- What is the approximate cost of the incident?
Date :		
		16.- Could it have been avoided?
		17.- Is training required?
		18.- Will the incident report be submitted to a management review?
		19.- Completed by :
		Name :
		Signature:
		Date :