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## Procedure

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### Background

Polychlorinated biphenyls, commonly known as chlorobiphenyls or PCBs, are industrial chemicals which were synthesized and commercialized in North America in 1929. They were used in the manufacturing of electrical equipment, heat exchangers, hydraulic systems, and several other specialized applications up to the late 1970s. They were never manufactured in Canada but were widely used in Canada.

PCBs are very persistent both in the environment and in living tissue. The most obvious signs of environmental harm caused by PCBs are in aquatic ecosystems and in species that eat primarily aquatic organisms. Because of concern for the environmental and health effects of PCBs, the Canadian government took action to eliminate PCBs from Canada.

Equipment containing PCBs is regulated under [Environment Canada PCB Regulations](#). The regulations apply to owners and persons using PCBs and PCB-containing equipment.

PCB Containing Equipment include: electrical capacitors, lamp ballasts, electrical transformers and their auxiliary electrical equipment, electromagnets, heat transfer equipment, hydraulic equipment, vapor diffusion pumps.

### Purpose

The purpose of this procedure is to prevent and minimize the risk from equipment containing PCBs at UBC, and gradually eliminate the use and storage of such equipment per Environment Canada prescribed schedule. Following this procedure will also facilitate compliance with Environment Canada PCB Regulations.

### Scope and Applicability

This procedure applies to all UBC's activities and operations affected by the above regulations. It identifies these activities and highlights the key requirements that must be followed to achieve and maintain compliance. These include:

- The ongoing operation, storage, and decommissioning, of equipment containing PCBs, and the disposal of PCBs containing oil, by Building Operations Head Electrician and Electrical Technical Specialists Under the supervision of Building Operation Electrical Manager .
- Decommissioning projects involving equipment containing PCBs, affecting Project Services and Properties Trust Project Mangers
- Disposal of light ballasts containing PCBs, affecting the Building Operations Waste Management group, at Municipal Services.



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### Responsibilities & Procedural Steps

#### Prevention of Release

- Staff working with equipment containing PCBs must prevent any release to the environment of PCBs in concentrations:
  - Greater than 2 mg/kg of liquid
  - Greater than 50 mg/kg for a solid
  - No greater than one gram from equipment that is in use

#### Prohibited Activities

- Staff working with equipment containing PCBs must be aware of and comply with the following prohibition:
  - Manufacturing, exporting or importing PCBs or products containing PCBs in concentration greater than 2 mg/kg
  - Sale of PCBs or products containing PCBs in concentration greater than 50 mg/kg
  - Processing or use of PCBs or products containing PCBs which past their "End of Use End of Storage" target date

#### Permitted Activities

- Use of oil containing PCBs in concentration of less than 2 mg/kg, for the purpose of servicing equipment containing PCBs.
- Laboratory analysis of PCBs in an accredited laboratory using accredited methods, and research into the effects of PCBs

#### End of Use End of Storage Deadline: Non- prescribed locations

All equipment containing PCBs must be removed from service and properly disposed according to the regulation prescribed schedule:

- In use equipment with more than 500 mg/kg PCB- required end of use and approved destruction by December 31, 2009
- In use equipment containing at least 50 mg/kg but less than 500 mg/kg of PCBs- by December 31, 2025
- Examples of equipment still in use:
  - Light Ballasts
  - Electrical capacitors, other than light ballasts
  - Electrical transformers and their auxiliary electrical equipment
  - Pole-top electrical transformers and their pole-top auxiliary electrical equipment
  - Electromagnets that are not used in the handling of food
  - Heat transfer equipment
  - Hydraulic equipment
  - Vapour diffusion pumps
  - Bridge bearings
  - Other PCBs and products that contain PCBs
- An inventory of all PCBs fluid containing equipment was established.



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- Plans should be made to remove, test, and replace any equipment as discovered containing more than 50 ppm PCB prior to 2025<sup>1</sup>.

### Testing and Analysis of Oil Containing PCB in Equipment

- Equipment which has the potential to contain oil with PCBs must be tested prior to decommissioning and disposal for the PCB content of the oil.
- The analysis of oil containing PCBs must be performed by an accredited laboratory using accredited methods
- Test records including date of test and results must be kept on file for at least 3 years

### Labeling Requirements

- Drums of oil waste containing PCBs and equipment containing PCBs must display the following label: "Oil waste/ equipment may contain PCB in concentrations below 50 ppm" or "Oil waste/ equipment Contains 50 mg/kg or more of PCBs" depending on the PCBs concentration.
- All labels should be black with white background and font size not less than 36 points
- For all equipment and containers, except capacitors, labels must be measure at least 150 mm x 150 mm.
- Labels for capacitors must measure at least 76 mm x 76 mm.
- For stored items, the date of start storage, needs to be displayed on the label

### Storage Requirements for PCBs containing equipment and oil

- Send for disposal and destruction in an authorized facility any equipment containing PCBs (in concentrations less than 500 ppm) within 30 days of end of use.
- Keep above equipment in proper storage during that time period
- PCBs or equipment containing PCBs must be stored in:
  - An enclosed structure (building, room, or other enclosed containment).
  - With a fence or wall 1.83 m high
  - On a curbed surface capable of containing 125% of PCBs if one unit containing PCB is in storage, or 25% of the PCBs contained in the largest unit, if several drums or equipment units, are stored at the same area
  - If the surface / floor of the storage area contains sumps or drains these must be closed/sealed to prevent any potential release
  - Outdoor storage should be covered with a water proof roof or barrier to prevent rain or snow from entering the storage area.

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<sup>1</sup> Plan for the removal of light ballasts containing PCB is to be developed



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- PCBs liquids or solids, must be stored in durable sealed containers, preventing weather effect or release to the environment
- If stored in drums, drum capacity should not be greater than 205L.
- Drums should not be stacked more than 2 drums high.
- Waste drums and equipment must be stored in a manner that is:
  - Accessible for inspection
  - Preventing fire and release
  - Separated from other stored materials
  - Access to storage area should be locked

### Fire and Spill response

Specific spill and fire response procedures were developed for the transformers and spill kit is available at the main Sub Station. The Spill response plan developed in 2005 was updated 2012 with accurate contact information (refer to [Appendix A](#)). This procedure needs to be reviewed periodically and updated as necessary by the Building Operations Head electrician and Electrical Manager

### Disposal of equipment Containing PCBs and PCBs Contaminated Oil

#### End of use end of storage disposal as part of Building Operations on-going service and maintenance activities

- Disposal should be coordinated by the Head Electrician (and ensured by the Electrical Manager), through a licenced hazardous waste transport to a Ministry approved Hazardous Waste disposal facility
- Manifests must be kept on file in the Head Electrician office and copy should be forwarded to RMS Environmental Services. Both green and the brown copy of the manifest should be retained for at least current + 2 years. The white copy of the manifest must be sent to the Ministry of Environment
- Request a certificate of destruction for each PCBs shipment from the disposal company and retain on file with the manifest (a copy to be sent to Environmental Services)
- Use the following BCG number for the disposal of waste containing PCB: BCG69186

#### Disposal of equipment containing PCBs as part of demolition projects

- Project Managers of Infrastructure Development Project Services, and Properties Trust, are responsible to ensure all PCBs containing equipment are disposed properly and manifest copies and copies of certificates of destruction are sent to Environmental Services for each shipment sent for disposal.
- For the BCG number for this PCB waste please contact 604-822-9840 for information

#### Disposal of Light Ballasts Containing PCBs by Building Operations, Waste Management



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- Ballasts collected as part of routine maintenance operations will be collected by Waste Management and stored per storage requirement prescribed in this procedure.
- Arrangement for disposal will then be made through UBC Environmental Services Facility by contacting ESF technician at 604-822-6306

## Training

The person signing the manifest needs to have a current certificate of TDG training (may be taken on line through a 3<sup>rd</sup> party provider such as Danatec Inc.) and Manifest Signee training (provided through RMS Environmental Services)

## Reporting requirements

- An annual report to Environment Canada needs to be submitted for any oil containing equipment or used oil, in concentration greater than 50 ppm PCB.
- The report must address equipment in use, storage or any disposal of equipment containing PCBs or PCB contaminated oil.
- UBC Environmental Services is complying the report on behalf of UBC by December 31 of each calendar year, based on information to be provided by:
  - Building Operations Head Electrician: the "[PCB Containing Oil Test Results](#)" spread sheet , as well as manifests and certificate of destruction of PCB waste sent for disposal
  - PCB waste sent for disposal from demolition projects: information to be submitted by Project Managers, Properties Trust and Project Services; to include test results, manifests and certificate of destruction, of each shipment of PCBs waste sent for disposal)
  - Manifests of disposal of PCB ballasts disposed through ESF



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**A. Spill Response Procedure**

**PCB Spill Response Procedure**

**Purpose**

The following procedure addresses the proper spill response in case of accidental release of oil containing Polychlorinated Biphenyls (PCBs) from electrical transformers or collection barrels mainly located at the UBC North (UNY) and UBC South (UNS) power sub-stations. UNY is located at 2446 Health Sciences Mall. UNS is located at 6075 Nurseries Road inside the South Campus Material Recycling Facility.

**Scope**

The spill procedure is intended for Building Operations staff servicing the electrical transformers or other electrical equipment that may contain oil with PCBs and/or responding to spills at the two UBC substations, UNY and UNS. The spills can occur during repairs and maintenance of transformers and capacitors containing PCB contaminated Voltesso 35 oil.

The two transformers at each location contain a main reservoir of 17,020 L and switching equipment with 11,000 L of Voltesso 35. 205 L drums are also stored in the plastic storage shed adjacent to each substation building. The transformers are located on crushed gravel overlying a buried copper grid. There is no spill containment in the form of drainage leading to a sump and separator. Note that the expected concentration of PCB in oil is approximately 1-30ppm.

**Procedure**

Planning, Preparation and Spill Prevention

- Provide appropriate spill kits, check regularly and replenish materials as necessary
- In the event of a spill, an Emergency Operations Centre (EOC) will be established in the substation building or at the Power House. The response to an emergency depends on the severity of the spill and its potential impact.
- The response to an emergency depends on the severity of the spill and its potential impact:
  - volume of spill, i.e. smaller or larger than reportable threshold quantity (100 L)
  - spill can or cannot be contained on site
  - the real or potential impacts of the incident
  - the spill can be completely handled by UBC Building Operations resources
  - risk to personnel, environment, equipment or the public
  - the need for outside support resources
  - who is contacted in an emergency
  - the degree of public/media/composite/communication



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- Spills should be prevented by regular inspections and testing of reservoirs and drums.
- Secondary containment (110% of capacity) of drums should be employed

### Spill Response and Control

- Spill kits are located at UNY & UNS (contents listed below)
- Identify the spilled material and confirm that it is Voltesso 35. Verify source (transformer or drum) and consult MSDS.
- Determine the severity of the spill (e.g., amount, exact location, area affected, continuing).
- Decide if your level of training allows you to safely clean up the spill.
- If the spill cannot be safely and readily contained, call 911.
- Workers should protect themselves and others by:
  - Shutting off ignition sources – NO SMOKING and staying upwind of vapours
  - Warning others to stay out of the substation yard – shut gate and post hazard tape.
  - Wearing appropriate PPE: impervious, chemical-resistant clothing and footwear, goggles, nitrile, neoprene or Viton gloves, and full-face organic vapour cartridge respirator where oxygen is adequate (i.e., in yard NOT in substation building).
- Call for assistance – notify a supervisor.
- Respond to the spill only if safe and feasible to do so.
- Use spill kits (supplies and equipment) located in the shed adjacent to the substation building; response kits are maintained to ensure that sorbents, plugging compound and other basic items are available for immediate use whenever needed.
- Stop the flow by using a plugging compound if practical and safe to do so.
- For small spills, place drum, sorbent pads or pillows so that leak is contained.
- Do not flush oil into adjacent sewer/drainage system.
- For large spills (more than several hundred litres), isolate area and call contractor.
- Clean up by applying sorbents to small spills (less than 1 drum or 205 L) and excavate small amounts of contaminated gravel.
- Place spill clean-up materials in labelled containers and seal them.
- Contact ESF to make arrangements for pick-up and proper disposal as hazardous waste.
- Refer to detailed “Spill Contingency Plan” (hard copy available with Building Ops Head Electrician and RMS).
- Depending on the severity of the spill the following persons/agencies should be contacted:
  - Fire Department (HazMat)
  - Cleanup contractors (e.g. [CEDA](#) or [TERVITA](#))

### Training

All workers are trained in spill clean-up procedures in case of emergencies.



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Spill Reporting

All spills should be reported to the following agencies:

- UBC Building Operations (Service Centre, 604-822-2173)
- UBC Building Operations ([Stan Takenaka](#), Head Electrician, 604 822-4943, cell: 604 916-0631)
- UBC Building Operations ([Karl Fox](#), Superintendent Trades, 604 822-5644, cell: 604 868-4542)
- UBC Risk Management Services (Main Office, 604-822-2029)
- Complete the [Spill Reporting Form](#) on next page

**Spill Kit Checklist:**

- |                                                                                                 |                                                                              |
|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| <input type="checkbox"/> oil sorbent pads                                                       | <input type="checkbox"/> shovel, rake set                                    |
| <input type="checkbox"/> particulate sorbent                                                    | <input type="checkbox"/> 1 Spill Squeegee, Floor Size, 18" Head              |
| <input type="checkbox"/> oil sorbent socks                                                      | <input type="checkbox"/> 1 Spill Squeegee, Bench Size, 8" Head               |
| <input type="checkbox"/> 10 Spill Control Pillows, 1 litre size                                 | <input type="checkbox"/> 1 Polypropylene Broom                               |
| <input type="checkbox"/> 1 Instruction Booklet                                                  | <input type="checkbox"/> 1 Bench Brush                                       |
| <input type="checkbox"/> 1 roll Barricade Tape, 100 feet                                        | <input type="checkbox"/> 1 Dust Pan                                          |
| <input type="checkbox"/> 1 Wringer                                                              | <input type="checkbox"/> 1 Liquid Cleaner, 1 litre                           |
| <input type="checkbox"/> 2 Spill Clothing Kits - SHOULD BE SEALED (see also Checklist below)    | <input type="checkbox"/> 1 roll Chem/Kleen-Ups Towels, 9 3/4" X 100 ft. roll |
| <input type="checkbox"/> 1-10 litres Damming Material (unreactive, absorbent, e.g. vermiculite) | <input type="checkbox"/> 5 Hazardous Waste Disposal Bags 12" X 18"           |
| <input type="checkbox"/> Plugging Compound                                                      | <input type="checkbox"/> 5 Biohazard Waste Disposal Bags 12" X 24"           |
|                                                                                                 | <input type="checkbox"/> Waste Disposal Bags 12" X 18"                       |

**Personal Protective Equipment (PPE) List:**

- TYVEK coveralls and encapsulated suits
- Rubber boots
- Foot covers, disposable, polyethylene
- Nitrile gloves (disposable)
- Chemical splash goggles, fog-free lens
- Dust and mist respirator
- Cartridge respirator (organic vapour – sealed)
- Self-Contained Breathing Apparatus (SCBA) **(for use by trained personnel only)**





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**Spill Reporting Form**

**Fax to: Risk Management Services (604-822-6650)**

**Attn: Manager, Environmental Services**

**Copy to be forwarded to Administrative Head of Unit**

**EMERGENCY RESPONSE INITIATED**

YES

NO

Name \_\_\_\_\_

Dept. \_\_\_\_\_

Phone number \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Material spilled \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Quantity \_\_\_\_\_

Location \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date & time of spill \_\_\_\_\_

\_\_\_\_\_

Description of spill, including cause and actions taken

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Agencies attending scene (e.g. Fire Dept. etc)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please include any additional information on a separate sheet.



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### B. Equipment Containing PCBs for Testing

UBC Units Containing oil with more than 50 ppm PCB

Green background for equipment that is no longer on campus

Equipment #	Description	Detailed description (type of unite, manufacturer)	PCB Level (ppm)	Vendor ID #	Volume of oil in equipment	For each year indicate: in use/in storage/disposed				
						2008	2009	2010	2011	2012
0204	UNY Capacitor	Westinghouse inerteen capacitor, serial # 738039AU (45 total)	800,000	PCB-12-2376-01	Tested Oct 10, 2012	in use	in use	in use	in use	in use (*)
0047	Hebb T1	UBC ID # 0047	57	904120125	Tested April 19, 1999					
0061	4CB62	UBC ID # 0061	140	011220196	Tested Nov 29, 2000					
0071	SS2	UBC ID # 0071	50	011220206	Tested Nov 29, 2000					
0072	4VR62	UBC ID # 0072	79	011220207	Tested Nov 29, 2000					
0073	4VR61	UBC ID # 0073	110	011220208	Tested Nov 29, 2000					
0074	4VR	UBC ID # 0074	110	011220209	Tested Nov 29, 2000					
0076	4VR58	UBC ID # 0076	180	011220211	Tested Nov 29, 2000					
0078	4VR62	UBC ID # 0078	920	011220213	Tested Nov 29, 2000					
0080	4VR60	UBC ID # 0080	93	011220215	Tested Nov 29, 2000					
0081	4VR61	UBC ID # 0081	390	011220216	Tested Nov 29, 2000					

removed Oct 26, 2012

Green background for equipment that is no longer on campus



# Management of Equipment Containing PCBs

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END OF DOCUMENT

Approved by:

Name and Title	Date	Signature
<b>Ron Holton,</b> Chief Risk Officer, Risk Management Services	Jan 28/15	
<b>Karyn Magnusson</b> Managing Director Building Operations	Jan 28/15	
<b>John Metras,</b> <del>Manufacturing</del> Director Infrastructure Development	JAN. 28/15	