

Section Number
Laboratory Decontamination
Date

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Part 1.0 SECTION DESCRIPTION

University of California, Berkeley (UC Berkeley) teaching and research laboratories use hazardous chemicals, bio-hazardous agents, and radioactive substances. Construction projects, such as renovation or seismic improvement, often involve laboratory space. This section contains specifications for laboratory decontamination work performed by the Contractor.

Lead and asbestos issues are part of this contract if they are listed in Part 3.0 of this Section.

Part 2.0 CONTRACTOR SCOPE OF WORK

2.01 General Requirements

Contractor will provide all materials [except drums and hazardous waste labels which will be provided by UC Berkeley Office of Environment, Health & Safety (EH&S)], tools, personnel, protective equipment, chemical analysis capabilities, and knowledge to remove hazardous chemical residues from laboratories. The Contractor shall clean enough to assure construction workers that there is no short or long term danger of chemical exposure.

Contractor is responsible for their employee hazard awareness, personal protective equipment, and safety training. Contractor shall submit a copy of their Health and Safety Plan to the PM. The PM shall forward the plan to EH&S for review. The Contractor shall comply with all the requirements of applicable federal, state, and local safety, health, and environmental regulations while working at the job-site.

Prior to the Contractor decontamination work, EH&S will have removed all hazardous chemical containers from the room. The Contractor is not responsible for removing containers of hazardous chemicals. If the Contractor finds a hazardous chemical container, contractor should notify the project's UC Berkeley project manager (PM). The PM will notify EH&S to remove the container.

Hazardous waste generated during the decontamination (e.g., cleaning rags, gloves, protective clothing, contaminated pipes, liquid from sink traps), will be disposed of by EH&S. The Contractor shall package the waste according to Part 3.0 of this section. EH&S will supply the Contractor with 55- 30-, or 5-gallon DOT approved containers and labels for hazardous waste generated during the decontamination project. The Contractor shall notify the PM when drums are ready for pick

up. EH&S will pick up the waste upon request by the PM. (see 5.05 below)

If triple-wash-rinse decontamination procedures do not remove chemical stains, then the Contractor shall notify EH&S. If EH&S determines that the stain shall be removed, the Contractor shall remove it by chipping, jack-hammering, cutting, or other means of physical removal. The contaminated debris from stain removal shall be placed in a container for disposal as hazardous waste.

2.02 Room Locations and Scope of Decontamination

See section 6.01 for a sample spreadsheet that includes the room number and scope of decontamination work. This spreadsheet only covers general scope. The Contractor is expected to work with the PM and EH&S to develop room specific decontamination goals. See Subsection 2.03 Assessment.

2.03 Assessment

Contractor will meet with EH&S and other UC Berkeley project or departmental staff to ascertain the prior history of the room and assess potential hazards. Chemical inventories will be made available to the contractor if necessary. If a specific chemical was used that has unique clean-up requirements, then the Contractor will identify the clean-up requirements, clean-up verification sampling requirements, and perform the work after assessing each room to determine the time, labor, materials, and cost estimate required for room decontamination.

Contractor will assess the room and determine if floors, fume hoods, benches, cabinetry, or sink drains are contaminated with mercury. The contractor will use a hand-held mercury analyzer that has been properly maintained and calibrated. Only trained personnel will use the instrument. The contractor will make a map of the survey area to document the assessment.

If EH&S identified stains from polychlorinated biphenyls (PCBs) sources, the Contractor will determine the extent of contamination, decontaminate, perform clean-up verification sampling and document the work with maps and written descriptions according to Code of Federal Regulations Title 40, Part 761.125 "PCB Spill Clean-up Policy". Diffusion pumps, power supplies and fluorescent light ballasts are typical sources of PCBs.

Part 3.0 OTHER APPLICABLE SECTIONS [Reserved]

Part 4.0 SPECIFIC REQUIREMENTS

4.01 Work Area Boundary

The Contractor shall establish a work area boundary that will accomplish the following objectives:

- Establish a decontamination zone to allow only authorized access to the contaminated area and the personnel decontamination area
- Ensure that non-authorized people do not accidentally enter the contaminated area
- Ensure the safety of people in the vicinity of the work area
- Ensure that contaminants are not spread outside the work area.

4.02 Bio-hazardous Materials

Note to the PM: Laboratories that were used for bio-hazardous materials will have to be evaluated on a case-by-case basis to determine if clean-up will be part of this specification. Contact EH&S for a determination.

4.03 Radioactive Materials

State, federal, and campus regulations require laboratories to be free of regulated radioactive materials before they are released to the Contractor. If regulated radioactive materials were used in the room, the room will be cleared by UC Berkeley's Office of Radiation Safety (ORS) prior to the Contractor performing work in the room. The PM will provide documentation to the Contractor that ORS has determined the room to be free of regulated radioactive contamination.

If Contractor discovers an intact radioactivity warning label, immediately notify ORS (643-8414).

Remodeling or removal of equipment may expose previously inaccessible areas that require ORS to return to complete the survey. This will be performed on a case-by-case basis. The PM shall work with ORS to ensure that all surfaces or equipment

are below regulated radioactive limits before allowing Contractor to proceed with equipment removal.

4.04 Chemical Materials

Fume Hoods

UC Berkeley will inform the contractor if perchloric acid was used in the fume hood, and if applicable, the contractor shall follow appropriate procedures for preventing an explosion while decontaminating. If perchloric acid was not used in the fume hood, then the contractor will use Simple Green® (or alternate detergent approved by EH&S) to triple wash and rinse all surfaces of the fume hood including sashes, plenum, work surface, cabinets, and shelving. If the fume hood will be reused, then it can be released upon inspection by EH&S (Contractor will notify EH&S when the fume hood is ready for inspection). If the fume hood will be disposed of, Contractor will take two wipe samples of the decontaminated surfaces. The Contractor shall have one of the wipe samples analyzed for California CAM-17 Metals, and the other sample shall be analyzed for EPA 8270 Semi-volatile chemicals. Contractor shall have the samples analyzed by a California Certified analytical laboratory that has been approved for the analysis requested. The Contractor shall provide a price per sample, including a breakdown of labor to take the sample, materials, and analytical costs.

Benches, cabinets, floors, walls

The contractor will use a detergent (such as Simple Green®) to triple wash and rinse surfaces. If these items will be reused, then they can be released. If the items will be disposed of, then Contractor shall take two wipe samples of the decontaminated surfaces. The contractor shall have one of the wipe samples analyzed for California CAM-17 Metals, and the other sample for EPA 8270 Semi-volatile chemicals. Contractor shall have the samples analyzed by a California Certified analytical laboratory that has been approved for the analysis requested. The contractor shall provide a price per sample, including a breakdown of labor to take the sample, materials, and analytical costs.

Drain Traps and Plumbing

Laboratory drain traps are assumed to contain mercury. If drain traps are to be removed, the Contractor will remove the trap, drain the liquid from the trap into a labeled 5 gallon bucket, and then place the trap in a separate labeled container.

Labeled containers will be provided by EH&S. (See “*Mercury*” in this subsection for additional requirements.)

Vacuum Pumps and Lines

Vacuum systems may contain mercury or PCBs. Use spill prevention methods to avoid spilling mercury when removing vacuum lines. Drain vacuum lines into a 5-gallon container. If contaminated (see Part 2.03 Assessment), put vacuum lines into a labeled 55, or 30-gallon container. PCBs may be a contaminant in some vacuum systems where diffusion pumps were used in laboratories and hooked in series with the building vacuum supply. If EH&S determined PCBs are present, then building vacuum supply pump oil is likely contaminated. Contractor shall sample fixed surfaces (e.g., walls, floors, anchored benches) for PCBs and decontaminate non-porous fixed surfaces according to CFR 40 Part 761.125 “PCB Spill Clean-up Policy”. Contractor will drain oil-filled equipment in preparation for pick up by EH&S. EH&S will provide labeled containers for the oil. EH&S may request the Contractor to sample non-fixed equipment and, if found to be contaminated, clean or dispose of it. Cleaning or disposing of the equipment will be a case by case decision made by the PM.

Sealant

If any sealant was installed prior to 1979, then it is assumed to contain lead, asbestos and PCBs. On a case by case assessment, the PM may ask the Contractor to remove sealant from interior or exterior building surfaces. Contractor shall place the removed sealant in labeled containers provided by EH&S.

Fluorescent Light Ballasts

Fluorescent light ballasts that do not display a “NO PCBs” label (probably manufactured before 1979) are assumed to contain PCBs. The contractor shall collect these ballasts in a labeled container provided by EH&S. The contractor shall also package for disposal light fixtures that are contaminated by ballast leaks. EH&S will pick-up and dispose of these wastes.

The contractor will collect non-PCB ballasts and send them to a metal recovery facility.

Fluorescent Light Tubes

The Contractor shall collect light tubes and place them in labeled boxes for pick-up by Physical Plant—Campus Services

(PP—CS). Contractor shall notify the PM when pick-up is needed. Contact the PM for labeled boxes, supplied by PP-CS.

Mercury

The contractor shall have a mercury spill kit and a mercury vacuum, on site at all times when working on sanitary sewers. The Contractor shall clean up any visible mercury which may be discovered or accidentally spilled while emptying sink traps or plumbing lines (sanitary sewer and 'acid waste' lines). **If mercury is detected visually or by mercury vapor detection, the Contractor shall immediately notify the PM. The PM shall immediately notify EH&S.**

Pooled mercury may be encountered under cabinet bottoms or in cabinets under p-traps. All visible mercury must be removed when it is spotted. Areas that have high mercury vapor but have no visible mercury, should be thoroughly cleaned using Mercon wipes or vacuuming (using a vacuum designed for mercury containment).

The Contractor shall clean-up all mercury contaminated surfaces including floors, benchtops, equipment, walls, and fumehoods using methods that will not spread contamination to non-contaminated areas.

The Contractor shall verify that mercury vapor levels in rooms requiring mercury decontamination are below the decontamination clearance level of 0.005 mg/m^3 . [Note: This level is set for worker health and safety by EH&S and is one-tenth of the 8-hour OSHA Permissible Exposure Limit (PEL) of 0.050 mg/m^3 .]

- Contractor shall not leave visible mercury contamination in rooms.
- Clearance air samples shall be taken using a calibrated mercury vapor analyzer that can detect mercury vapor to 0.001 mg/m^3 . The Contractor shall provide the name, model number, date calibrated, manufacturer name and phone to EH&S for approval.
- Clearance samples for contaminated areas larger than 4 square feet will be taken by dividing the area into a square grid with 2 foot spacing and measuring mercury vapor in the approximate center of each grid area. Contractor shall document location, time, date, sample value (mg/m^3), and sample identification number on a map of the area being cleared.

- Clearance samples for contaminated areas less than 4 square feet will require 2 samples within the boundaries of the cleaned area.
- Clearance level is 0.005 mg/m³ at a distance of approximately 2 inches above the cleaned surface. To pass clearance, all samples within the area must average below 0.005 mg/m³ mercury vapor clearance criteria.

Ozone Depleting Compounds

The Contractor shall decontaminate refrigeration or air conditioning equipment before PP—CS removes the ozone depleting compounds (refrigerants) from the unit. The Contractor shall notify the PM when the equipment is ready for servicing. PM shall contact PP—CS for equipment servicing.

Part 5.0 HAZARDOUS WASTE STORAGE AND PICK-UP

5.01 Containers

Containers used for storage of waste must be United States Department of Transportation (DOT) approved. EH&S will supply the Contractor with 55, 30, or 5 gallon containers. The contractor shall supply bins, tanks, or tank trucks when necessary. EH&S will select containers that are chemically compatible with the material to be stored in them. Containers shall remain closed at all times except when material is being added.

5.02 Labels

Containers of hazardous waste shall display hazardous waste labels. The pre-printed labels will be supplied by EH&S. Before waste is accumulated, the Contractor, the PM and EH&S shall identify and define waste streams. **The Contractor shall not mix different waste streams in the same container.** The Contractor shall mark the initial accumulation date on the hazardous waste label when waste is first placed in the container.

5.03 Waste Storage Area

Contractor will store closed and sealed waste containers on the construction site in a locked, secure area out of the elements. The storage area, room or structure shall be identified by the PM, EH&S and the Contractor on an as needed basis.

Quantity and limits for waste storage areas are 55 gallons for non-acutely hazardous waste, and 1 quart for acutely hazardous waste. The PM will notify EH&S for hazardous waste pick-up (see 5.05 of this section for waste pick-up instructions).

5.04 Inspections

Contractor shall inspect the waste storage area weekly using the Inspection Form—Construction Site Hazardous Waste—Satellite Accumulation Area (Attachment 2). Contractor shall inspect the storage area to ensure the containers are not leaking, are segregated into compatible groups, and labeled properly with appropriate dates and waste description. Contractor shall complete the inspection form on a weekly basis. The Contractor shall maintain the completed inspection forms in a file for PM or EH&S review.

5.05 Container Pick-up Request

Once the quantity limits are reached, EH&S has three days to transport the waste to the campus Hazardous Materials Facility. **Contractor shall notify the PM before the quantity limits will be reached to facilitate timely removal by EH&S.** PM shall request pick-up no more than one working day from the date the 55 gallon limit is reached. EH&S shall pick-up the waste no later than three days after the 55 gallon limit is reached.

If the quantity limits are not reached, then Contractor shall notify the PM before 270 days from the initial accumulation date will be reached to facilitate timely removal by EH&S. PM shall request EH&S to pick-up the waste before the 270 day limit.

5.06 Spill Response

Contractor shall maintain enough spill response supplies to contain at least 110% of any accumulated waste. Immediately call the PM if there is a spill. Respond to the spill at the soonest, safest possible moment. Contractor shall clean-up the spill and contain it according to the requirements of this specification. PM shall immediately notify EH&S. EH&S will provide assistance in regulatory agency notification, and reporting (if necessary).

Part 6.0 REPORTING

6.01 Spreadsheet/Decontamination Tracking

Contractor will use a spreadsheet to list rooms to be decontaminated and track decontamination progress (See Attachment 1—Spreadsheet Example). A description of the contamination shall be attached to the spreadsheet (contaminants are determined in the assessment phase of this Section). Once the room is decontaminated, contractor will notify the PM. PM will contact EH&S for a visual inspection and final clearance. Once the room is cleared, EH&S will place a sign on the laboratory door stating the room has been decontaminated. The sign will have the EH&S phone number (642-3073) and contact in case there are inquiries.

6.02 Samples and Analytical Reports

The Contractor shall use a unique identification number that can be referenced to the location sampled. The contractor shall use industry standards to collect samples, including methods, preservation, containers, and chain of custody. The Contractor will provide a map of the sample locations along with the original analytical reports to EH&S. The Contractor will also provide copies of these documents to the PM.

Part 7.0 ATTACHMENTS

Attachment 1—Spreadsheet Example

Attachment 2— Inspection Form

Attachment 1—Spreadsheet Example

Building:
Project Name:
Project Number
Project Start Date:
Capital Projects Project Manager:
Inspector of Record:
Building Contact:
Department Contact:
Revised Date:
Contractor:

Room	Bio	Rad	Chem	Merc	PCB	Fume Hood	Vac System	Drain Traps	Surfaces

Attachment 2—Inspection Form

Inspection Form
University of California, Berkeley

Construction Site Hazardous Waste
Satellite Accumulation Area

For any “No” answers, complete the attached follow-up form.

<p>1. Containers A. Storage containers are United States Department of Transportation (DOT) approved. B. Containers are chemically compatible with the material to be stored in them. C. Containers are closed unless material is being added to them. D. Containers do not leak and are in good condition.</p>	<p>1 _ Yes _ No _ N/A</p>
<p>2. Labels A. Containers display labels with the words “hazardous waste”? B. Is the initial accumulation start date written on the container? C. Contents description? D. Physical state of contents? E. Generator name and address? F. Hazardous characteristics of the contents?</p>	<p>2 _ Yes _ No _ N/A</p>
<p>3. Waste Stream There is no co-mingling of waste-streams inside the containers?</p>	<p>3 _ Yes _ No _ N/A</p>
<p>4. Quantity Limits Are quantity accumulation limits in compliance? Limits: 55 gallons for non-acutely hazardous waste, and 1 quart for acutely hazardous waste, for each waste stream.</p>	<p>4 _ Yes _ No _ N/A</p>
<p>5. Container Pick-up Request A. Upon reaching quantity limits, containers are removed from the SAA within 3 days. B. Have all containers been removed (whether or not they are full) after being in use for 270 days?</p>	<p>5 _ Yes _ No _ N/A</p>
<p>6. Spill Response A. Are spill response supplies maintained to contain at least 110% of any accumulated waste? B. Are personnel trained to immediately call the Project Manager and inform him of any spill? C. Are floor drains or storm drains protected from potential spills?</p>	<p>6 _ Yes _ No _ N/A</p>
<p>7. Hazardous Waste Management Awareness A. Contractors are instructed to collect hazardous waste so that the University can dispose of it properly. B. Are sinks are posted with warning signs?</p>	<p>7 _ Yes _ No _ N/A</p>

Inspection Date _____ Inspector Name _____

Project _____ Building _____

Project Contact
Name _____ Phone _____ FAX _____

Inspection Follow-up
University of California, Berkeley
Construction Site Hazardous Waste
Satellite Accumulation Area

Follow-up Activity	Completion Date
1. Containers A through D	
2. A through F	
3. Waste Stream	
4. Quantity Limits	
5. Container Pickup Request A and B	
6. Spill Response A through C	
7. Hazardous Waste Management Awareness A and B	

