*This document is under review, if you have any input, please email safety@unsw.edu.au

Laboratory Hazardous Waste Disposal Guideline – HS321

Specific Category Information	Legislation, Australian Standard
2.1	• AS/NZS 2243.3
2.2	• AS/NZS 2243.1

Upper Campus Store, LG018 Loading Dock, E26 Bioscience South – 9 3835 2007
Lower Campus Store, SEB, Building E8 – 9 3835 4695

Non-contaminated broken glass

All large pieces of broken glass are to be collected in the white 20L lidded buckets.
The bucket must be labelled "Non-contaminated broken glass" unless the glass has been contaminated.

Contaminated broken glass

Contaminated broken glass must be segregated from non-contaminated broken glass and the bucket labelled as "Contaminated broken glass", and name the contamination e.g. biological, or type of chemical.
NOTE: If contaminated glass ends up in the bucket with uncontaminated glass, the bucket must be labelled according to the contamination as "Contaminated broken glass".
Small glass items, such as Pasteur pipettes, glass slides, cover slips and small glass vials can be disposed of into yellow sharps containers. See also 2.3.

When disposing of any broken glass, ensure any contamination hazard is taken into account before disposal.

Note: Only glass "sharps" are to be placed in buckets that are labelled as containing broken glass. Do not mix broken glass with sharps of other materials or with other types of waste.

2.2.1. Labelling

The broken glass waste label requires the following information:

Waste Category: (type of) Broken glass

Specific hazard information : Broken Glass – keep lid closed

Waste Generator: person responsible for the waste

Date: date or period over which the waste was generated

Building : Building and bui.8 (h)0.8 (h)0.5 Tc 4bf0.1004-Tc2u-1-(8.1)-(6.4)(at)-33.3(t)s1.2g(i)3.1(b)u12w(l)23.3

20L white for broken lab glassware and larger sharps

2.4. Chemical Waste disposal

Hazardous chemicals from teaching and research facilities and from workshops must, under no circumstances, be allowed to enter storm water drains. Do not dispose of any hazardous chemical down the sink (see also section 2.4.7). In addition, careful consideration shall be given to the location and bunding of chemical waste containers to ensure any potential leaks do not enter indoor or outdoor drains, including storm water drains.

Non-hazardous liquid chemical wastes disposal must be as described in paragraph 2.4.8.

Hazardous chemical wastes must be appropriately labelled and segregated during storage according to 2.4.5 and 2.4.6. Not all chemicllo 2.actes doorH. ap-1.1 (e)-d-12.2 (s)on13.2 (o t)-1.1 (h)- mat-13.2 (er-13.1 (i)3.1 (a)

2.4.1. Solid chemical waste

Solid chemical waste comes in a variety of forms and so containers can vary.

Powder waste (or similar) can be an inhalation risk e.g. when closing a waste bag. Preferably use the original container if no longer needed, or a lidded plastic container.

General laboratory waste, such as gloves, paper towels, rags etc, that are or may be contaminated with hazardous chemicals, can be disposed of in chemical-waste plastic bags unless there are items that could puncture the bag. More robust containers can be appropriate, such as white 20 L plastic buckets.

Biological tissues that have been chemically fixed or treated and are therefore no longer considered a biological hazard, need to be wrapped and sealed into appropriate containers so that the tissues are not recognizable and there is no leakage.

Contaminated broken glass and sharps disposal is described in 2.2 and 2.3.

2.4.2. Liquid -waste containers

Liquid-waste containers (available from the upper and lower campus stores) must be kept closed (sealed) at all times except when you are actually adding waste. It is not adequate to seal containers closed with cork, rubber, or ground-glass stoppers; aluminium foil; and polyethylene film or parafilm. Open the container only for as long as you need to add the waste.

A container with a funnel in the opening is not considered closed unless the funnel itself seals to the container and would prevent spillage.

If the waste is likely to generate gases during storage, vented caps should be used. These wastes must be stored so that vented fumes do not pose a hazard.

2.4.3.

Tissue samples in fluid , such as animal or human tissue samples fixed in formalin, are disposed in the following manner:

Drain off the fluid into a chemical waste container (no solid pieces are to remain in the fluid). This fluid becomes chemical waste and must be labelled according to its hazard. It is collected by the chemical waste contractor.

The solid wastes are wrapped so that they are unidentifiable as tissue, and don't leak. They become solid chemical waste and must be labelled according to the chemical hazard. Solid chemical waste is collected by the chemical waste contractor.

2.4.6. Labelling of chemicals waste

Chemical waste must be labelled in accordance with the following:

Clause 335 WHS Regulation, Part 3 of Schedule 9: If it is reasonably likely that a waste product is a hazardous chemical, then the label on the container of the hazardous waste must be written in English and at a minimum, include the following:

- the product identifier;
- the name, Australian address and business telephone number of either the manufacturer or the importer, (if the waste was generated in a UNSW laboratory then waste generator's contact details should be used); and
- a hazard pictogram and hazard statement that is consistent with the correct classification of the chemical.

Label formats that can be used are available for downloaded from the UNSW Health & Safety website. Local areas can add their own specific details. Download labels as follows:

You can complete a chemical waste request form as described in the summary in Section 3.1.

2.4.9. Permits to dispose of liquids down the sink or to trade waste

As described in this document, all chemical waste must be collected and arrangements made for its safe disposal using an EPA licensed waste contractor. There are two exceptions to this as outlined in HS750 Non-Hazardous Liquid Chemical Waste Disposal Procedure.

a) A non-hazardous liquid substance or mixture which is present at a concentration below the concentration cut-off point for a hazard class in the GHS and which is NOT hazardous to the aquatic environment, may be poured down the sink but you must get a permit to do this as described in HS750.

b) Building has a trade waste
UNSW must comply with the conditions of its Trade Waste Agreement with Sydney Water therefore, you must ensure that only non-hazardous waste enters the building trade waste, unless you have specific exemption from FM, as described in HS750. -wciarhi hi sal

In those areas using the yellow, 240L wheelie bins, and where there is no access to an autoclave, biological waste is placed into an autoclave or clinical waste bag which is then sealed. It is placed into another bio-waste bag, with the biohazard symbol on the outside, which is then sealed. Solid waste can also be wrapped in opaque wrapping and then sealed into a biological waste bag. This waste is labelled according to 2.5.2. and placed into a yellow bio-waste bin for collection by the Bio-waste contractor.

If using the new C64L Clinismart bin system (Figure 3), the bin itself needs to be lined (available from Stores). Solid biological waste can be placed directly into the bin. The bin liner must be tied closed, and the bin lid must be locked for transport.to the bio-waste store.

2.5.4. When freezing waste

Some freezers are used to store both biological waste as well as valuable samples. If Sterihealth is responsible for collecting biological waste from your freezer, please note that they will remove the entire contents of the freezer unless there is very clear indication which items are not for disposal.

Sterihealth has a bright pink sticker that can be used to clearly show the items that are for disposal. These stickers are available through FM General Services.

2.5.5. Disposal of solid biological waste

All biological waste (that is not contaminated with cytotoxic chemicals or other hazardous substances) must be either:

placed directly into a lined, (haz)-8.1 (ar)mTc 0 Tw 8.9em1 (ar)mTc2.3 (l)-iiartbe ei.

2.5.7. Storage

Biological waste in robust plastic bags must be contained in a solid-based container with a lid. The container is to be labelled “Biological Waste” and must display a biological hazard symbol (see figure 2).

If the waste is likely to putrefy before the day of bio-waste collection, it is advised to either freeze it or put it in a cold-room until the afternoon before the day of collection, and then take it to the yellow wheelie-bin. The L8500 Tc 0 Tw9Cm700 Tc 3e.1 (h)-12 (adv)-849f-12.3 (L3.2 (bi

Additional specific precautions and requirements apply to any carcasses that are contaminated with radioactive material (2.8), chemicals (2.4), cytotoxic substances (2.7), or that contain infectious agents or GMOs (2.5). See each of the individual hazard categories on how to deal with each of these.

Carcasses are to be frozen before placing into the bin. See also 2.5.4

Carcasses that contain cytotoxic substances must be put into the purple cytotoxic bins for incineration. (See 2.7)

No carcasses are to be placed into domestic waste bins.

Any uncontaminated solid animal waste products (not carcasses or tissue) and bedding, plant soil, plant containers and insect wastes (i.e. that are not contaminated with infectious microorganisms, GMOs, radioactive material or chemicals) may be disposed of as solid domestic waste. No such waste is to be disposed of to building drainage, storm water or the sewerage system. If you need extra regular green wheelie bins for this domestic waste, email your request to fmgeneralservices@unsw.edu.au. This waste must be sealed into robust plain plastic bags and must not be labelled or in any way identifiable.

2.6.1. Labelling of carcass n/Td ( )TjS l to 79w -3.347 -1.157 Td [(T)e C warcaswastelplael re rs toio waig-1.1 (e)--

An example of mixed waste would be tissues in a chemical fluid bath, such as when fixed in formalin. These are disposed of as chemical waste in the following manner:

> Drain off the fluid into a chemical waste container (no solid pieces are to remain in the fluid). If the fluid contains viable microorganisms or GMOs, it must be chemically treated (Appendix F in AS/NZS2243.3). This fluid becomes chemical waste, must be labelled according to its hazard and is collected by the chemical lu0 Tc 0 Tw-e-0 0 9.b4C.002 Tcc7 0 Td[/( )1512.3 ((

Cytotoxic Hazard Symbol

Figure 4: Hazard symbol for cytotoxic waste

Figure 5: Purple – cytotoxic waste bins

64L Cytosmart Waste bin; various purple waste bins

Cytotoxic Sharps bin

2.7.2. Storage

Cytotoxic waste in robust plastic bags must be contained in a solid-based container with a lid and the container labelled “Cytotoxic Waste” and display a Cytotoxic hazard symbol (see figures 4 and 5).

2.7.3. Disposal

Cytotoxic waste (purple cytotoxic waste bins) is collected from all biological waste collection points by a clinical waste contractor. Contact FM general services, fmgeneralservices@unsw.edu.au for any enquiries.

2.8. Radioactive Waste Requirements

Radioactive Waste can only be disposed of through an approved University process, with the direct approval of the UNSW Radiation Safety Officer.

Only material having less than the following activity may be disposed of as waste:

a) a concentration activity of less than 100 Bq per gm [2.7 mCi/kg] (i.e. not radioactive according to the legal definition) OR

b) Total activity of a given quantity of waste is <1 where Total Activity = A1/40 + A2/400 +A3/4000 + A4/40000 AND

- A1 represents the total activity (kBq) of group 1 radionuclides
- A2 represents the total activity (kBq) of group 2 radionuclides
- A3 represents the total activity (kBq) of group 3 radionuclides
- A4 represents the total activity (kBq) of group 4 radionuclides

Radioactive waste must be stored until the activity has reduced to the described, acceptable level. Once the levels have reduced to less than a) or b) above, it can be disposed of as hazardous waste by Emailing the RSO with a waste inventory, HS014_Waste_Inventory_Form, (outlining isotopes, activity and volume), and a Radiation Declaration form, (Toxfree Waste Declaration) for approval for disposal.

The documentation and approval can then be sent to FM General Services to arrange collection and disposal.

You can use radioactivity decay reckoners to calculate when radioactive waste will decay to levels determined by the EPA, which will allow its removal by contractors as chemical waste.

- Carcasses containing ionising radiation must be bagged and labelled according to 2.6 Carcass Waste requirements and stored frozen. However, this waste must be appropriately shielded until the radiation activity meets the requirements in points a) or b).
    - o They must not be autoclaved until the activity meets points a) or b).
    - o Carcasses must also be labelled with the Radiation Hazard symbol.
    - o This waste could include associated bedding, soil and containers.
    - o The freezer must show the Radiation Hazard symbol.

Please contact the UNSW Radiation Safety Officer on ext. 52912 for advice regarding your radioactive carcass waste disposal requirements.

2.8.1. Liquid radioactive waste

1. Radioactive liquid waste should be kept in a container labelled 'Radioactive Waste' until it is suitable for disposal. Labelling needs to include the following information:
    a) Type of Radioisotope;
    b) Calculated Activity at date of Radioactive Waste Disposal Request (Bq/gram);
    c) Contact name of waste generator and phone number;
    d) Originating School.
2. Radioactive organic solvent waste and water solutions should also be kept separate even if they are of the same radioisotope.
3. Radioisotopes which have short half-lives, (e.g. P^{32}) should be kept for a period of time depending on volume and activity (see 2.8.1 b) until the radioisotopes have decayed to below OEH disposal levels. This waste can then be disposed of as normal chemical waste (provide former radioactive details on the chemical waste form and fax to UNSW Health & Safety).

Mixed radioactive liquid wastes with short-lived isotopes [e.g., <30-day half-life (^{32}P)] should be segregated from isotopes with half-lives between 30 and 90 days (^{35}S, ^{125}I) and from long-lived isotopes (^{3}H, ^{14}C).

You must maintain an inventory of all activity added to waste containers, in order to ensure that the activity limit of 100 Bq/gm is not exceeded. They are usually measured quantities and should not be difficult to add up. Where total activity may exceed the limit, there are a number of alternatives:

a) Short half-life radionuclides, can be allowed decay in storage until appropriate levels are reached.
b) For long half-life radionuclides, it may be possible to mix differing levels of waste activities of the same radionuclides, to ensure that the total activity for that radionuclide remains below 100 Bq/gm.

Note: Do not mix different radionuclides

c) If this is not possible, carefully decant ONLY the high level scintillation liquid into a suitable vessel for long term storage. Label this as above and send a signed Radiation Waste Transfer form to UNSW Health & Safety.

1.1.1.1. Scintillation Waste and Scintillation Vials

To dispose of scintillation vials and their contents:

1. Collect sealed vials into a metal or fibreboard drum (available from UNSW Health & Safety) which has been lined with a strong plastic bag.
2. Seal the inner liner.
3. Seal the drum.
4. Label the drum with:-
    a) your name
    b) your laboratory
    c) a description of the contents
    d) the radionuclide
    e) activity (Bq) of isotope at current date
    f) weight (kg) of waste
    g) the date
5. Send a signed Chemical Waste form including the above information to UNSW Health & Safety.

Liquid scintillation vials and contents may be disposed of together if the activity concentration is below 100 Bq per gm (2.7 mCi per kg). Keep this type of waste separate and place in a hazardous waste drum lined with a strong plastic bag. Identify separately on the Chemical Waste form. Scintillation waste with activity concentration above 100 Bq per gm (2.7 mCi per kg) must be stored. Please contact the UNSW Radiation Safety Officer on ext. 52912 for advice.

2.8.2. Solid radioactive waste

Solid radioactive waste (contaminated pipette tips, lab coats, gloves, absorbent materials used to mop up spills etc.) should segregated as for liquid wastes into differing isotopes and then placed in a suitable container appropriate to the radioisotope (e.g. Fibre drums). The container should be lined with a thick strong plastic bag and labelled with radioactive hazard signs and completed waste labels. Where possible the container should be securely stored locally until decayed, pending disposal.

All Radiation Hazard signs and labels must be removed from items before placing them into the lined container. This container must have the Radiation Hazard signs and labels on the outside and can be used until full. If the containers are unable to be stored for decay in the area, contact the RSO in order to have the waste transported to the University's radiation store. This arrangement must be made prior to the waste being generated.

All requests for the pick-up & transfer of radioactive waste should be emailed to FM General Services and the UNSW Radiation Safety Officer as required.

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For storage and later disposal of radioactive carcasses, see 2.8.

Contact UNSW Health & Safety if you need further information regarding co-mingled waste.

2.12. General Laboratory Waste disposal

General laboratory waste is disposed of either as Chemical waste or as Biological waste, depending on the hazardous nature of the residue. It is not domestic waste.

General Laboratory Waste includes all waste paper, gloves, laboratory plastic-ware (e.g. plastic pipette tips, plastic tubes, petri-dishes, whether or not they have been used) outer wrappers, or other general laboratory material that is or may be contaminated with chemical or biological residues.

Absorbent materials and disinfectants that have been used to decontaminate surfaces or spills should be treated as chemical waste. They must not be treated as Domestic Waste.

2.12.1. From chemical and teaching laboratories as well as workshops

This general waste, if hazardous, is considered to be chemical waste and put out for collection by the Chemical Waste Contractor. For the disposal of non-hazardous liquid chemical waste, please refer to HS750 Non-Hazardous Liquid Chemical Waste Disposal Procedure.

2.12.2. From (micro)- biological and teaching laboratories as well as animal facilities

This general waste is considered to be biological waste and put into the yellow bins for collection by the Biological-Waste Contractor (unless it has been chemically decontaminated).

2.12.3. Labelling general laboratory waste

The General Laboratory Waste label requires the following information:

Waste Category: General laboratory waste

Specific hazard information: Chemical residue (or Biological residue – depending on the type of lab where the waste was generated). If relevant, add the DG information or the biohazard symbol to the outside of the container.

Waste Generator: person responsible for the waste

Date: date or period over which the waste was generated

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- other chemicals used in the workshop.
- Empty chemical, oil, petrol, solvent etc. containers.

b) All other waste must be placed in suitable waste receptacles before disposal in a skip or other appropriate container for reuse or recycling (e.g. scrap metal, timber off cuts, perspex, fibreglass, obsolete plant and equipment and building

b. Bags and containers must be in good condition, not leaking, not over-full and must be sealed. We have a duty of care to the waste contractor to ensure our waste is in a safe condition for transport.

Biological waste will be picked up from the designated points early in the mornings on weekdays only.

To get your waste picked up:

a)

Cytotoxic waste

2.3	Manager OHS	13 December 2010	13 December 2010	1. Facilities Management looking after waste management administration and HS Unit technical. 2. Web link's updated from old site to new site
3.0	Director Human Resources	14 April 2011	14 April 2011	Review entire document. Reformat to UNSW Guideline template. Revised Austr Standard2243.3, add references to SSBAs, revised waste collection responsibility (KN)