University of Reading

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TITLE: THE DISPOSAL OF LABORATORY WASTE

		Date
Author:	Mr Paul Willis, Technical Manager, Logistics, Operations	3rd March 2017
Reviewed by:	Health and Safety Co-ordinators (HSCs) Dr Rob Haigh (SCFP) Mr Simon Feist (SBS) Miss Marie Taylor (SAGES/SMPCS) Dr Steve Ansell (SAPD/SPCLS) Miss Jude Brindley (IoE/SBE/SACD)	March 2017
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1 Purpose

The purpose of this SOP is to ensure that all waste generated within the laboratories of the University of Reading (UoR) is correctly segregated and disposed of in accordance with the University's procedures and current legislation (see associated documents 6.1 – 6.4).

2 Scope

This document is intended for all categories of staff, students and visitors who work within the laboratory environment. It does not encompass the disposal of laboratory waste on UoR farms.

3 Responsibilities

Waste regulations apply to the University as an organisation, and to any individual who generates hazardous waste.

3.1 Waste Producer

The person responsible for waste produced by the School/ Department/ Directorate has a duty of care to ensure that waste is managed properly and is disposed of safely via the correct waste stream.

All waste producers have a responsibility for ensuring items are labelled and transported in accordance with Para 6.2.2-Secure Storage - UoR Safety Code of Practice 48 – Hazardous Waste, and Para 6.4-Waste Packaging, Transportation and Identification - UoR Safety Code of Practice 14 Part 7 Clinical and Biological Waste (see associated documents).

Waste producers may include the following:

- Cleaning Services.
- Laboratory Workers.

3.2 Principal Investigators and Supervisors

Principal Investigators and Supervisors must ensure that activity risk assessments that identify decontamination and disposal methods for all laboratory wastes produced are in place and adhered to. Where activities involve biological agents in hazard group 2 or above or any genetic modification (GM) work then these risk assessments must be reviewed and the work approved by the University's Sub-committee for Biological Safety.

3.3 Technical Services.

Technical Services (TS) are responsible for the provision of training in laboratory waste disposal; management of chemical waste disposal; overseeing the provision of waste containment materials; management and advice regarding the disposal of materials containing mercury and spent acids and alkalis; and management of soil waste.

3.4 University approved waste contractor

The university approved waste contractor is currently SELECT Environmental Services.

4 Waste Types

4.1 Clinical and Sharps

Clinical waste (also known as "Healthcare" waste) is defined in The Controlled Waste (England and Wales) Regulations 2012, Schedule 1 as waste from a healthcare activity, or waste of a similar type arising from other activities which may:

- Contains viable micro-organisms or their toxins which are known or reliably believed to cause disease in humans or other living organisms.
- Contains or is contaminated with a medicine that contains a biologically active pharmaceutical agent.
- Is a sharp, or a body fluid or other biological material (including human and animal tissue) containing or contaminated with a dangerous substance as defined by The Dangerous Substances Directive (67/548/EEC).

4.2 Biological

Biological waste consists of, or material contaminated with biological agents (i.e. "micro-organism, cell culture, or human endoparasites which may cause any infection, allergy, toxicity or otherwise create a risk to human health"). This includes waste from bacteriology, virology and tissue culture laboratories.

4.3 Genetically modified organisms (GMO)

GMO waste consists of (or material contaminated with) genetically modified organisms, cell cultures or other (higher organisms) which may cause infection, allergy, toxicity or otherwise create a risk to human health or to the environment. Waste contaminated by GMOs must be inactivated by validated means before disposal. The waste routes must be specified in the risk assessment (which must be approved by the Sub-committee for Biological Safety before work commences) and local rules.

4.4 Chemical (Hazardous)

Chemical waste consists of all unwanted chemicals that may display the following traits; flammable, corrosive, oxidising, toxic or hazardous for the environment.

4.5 Laboratory Consumables

Laboratory consumables consists of items such as non-contaminated centrifuge tubes, disposable flasks, petri dishes, micro-titre plates, weigh boats, gloves and gloves contaminated with residual chemical, pipettes and pipette tips and glass/plastic bottles.

4.6 Glass

Unwanted contaminated or non-contaminated glass.

4.7 Hazardous Waste Electrical and Electronic Equipment (WEEE)

Hazardous WEEE consists of items contaminated with hazardous substances.

4.8 General and Uncontaminated laboratory waste

Items such as paper, card, lab equipment packaging and paper towels from hand washing.

4.9 Food

Food waste refers to the discard of edible foods that have been used in, or produced from, specialist laboratory areas.

4.10 Soil and sediment

Soil, sediment and stones containing hazardous substances.

5 Procedures

Dilution and sink disposal should only be conducted in accordance with a suitable and sufficient risk assessment; and in accordance with CLP EC 1272/2008 (see associated documents) or the "Red List" from the UK Trade Effluent (Prescribed Processes and Substances) Regulations 1989, which can also be viewed in Appendix 7 to UoR Safety Code of Practice 48 – Hazardous Waste (see associated documents). A water companies' guide on discharge is also provided.

Guidance on container types can be seen at Appendix 1.

5.1 Clinical waste and Sharps

Clinical waste must be disposed of via the approved University provider. All Clinical waste must be disposed of using the relevant waste stream as follows:

- **Animal Tissues (non-infectious)**: Orange (Clinical waste for alternative treatment – off site autoclave or microwave treatment):
    - **Liquids**: Liquids can be disinfected with an appropriate chemical disinfectant and disposed of to drain. The disinfectant is checked for efficacy in accordance with the manufacturer's safety data sheet, which lists what pathogens will be destroyed by the disinfectant. The safety data sheet for a product also describes disposal considerations.
    - **Solids**: Place in orange bag. This should include gloves, tissue roll, plastics and packaging that have been contaminated with clinical materials.
    - **Serological**: Pipettes and pipette tips and other slightly sharp objects are to be placed in a boxed orange bag.
    - **Sharps**: All sharp objects should be placed in an orange topped sharps container.
- **Human and Animal Tissues (infectious)**: Yellow (Clinical waste for incineration only):
    - **Anatomical waste** (includes body parts, other recognizable anatomical items and carcasses): Store frozen until ready for disposal in yellow bags.
    - **Liquids**: Liquids can be disinfected with an appropriate chemical disinfectant and disposed of to drain. The disinfectant is checked for efficacy in accordance with the manufacturer's safety data sheet, which lists what pathogens will be destroyed by the disinfectant. The safety data sheet for a product also describes disposal considerations.
    - **Solids**: Place in yellow bag. This should include gloves, tissue roll, plastics and packaging that have been contaminated with clinical materials.
    - **Serological**: Pipettes and pipette tips and other slightly sharp objects are to be placed in a boxed yellow bag.
    - **Sharps**: All sharp objects should be placed in an orange topped sharps container.
- **Cytotoxic and cytostatic medicines**: Yellow bin with Purple lid (High temperature incineration):

- Cytostatic and cytotoxic chemicals must be disposed of in yellow receptacles with purple lids and placed into yellow wheelie bins for high temperature incineration.

- Tiger waste

Tiger waste is managed by BRU staff.

Clinical waste and sharps should be placed in the correct container by waste producers, as directed in Appendix 1. Once full the waste producer should seal the container and complete the attached label with all required information: recording the type of material; its hazardous properties; the quantity; the date that the waste was generated or placed in storage; the producer's contact details.

Clinical waste is placed in yellow clinical waste bins known as Eurocarts, and collected by SELECT on a fortnightly basis from the following areas:

- SCFP/Hopkins buildings. Waste producers are to place clinical waste containers in the yellow Eurocart outside the logistics store.

- Knight building. Waste producers are to contact a member of TS within the Knight building, who will issue a key to the clinical waste store, where the waste producer will place the waste.

- APD building. Waste producers are to place clinical waste containers in the yellow Eurocart located opposite the greenhouses at the back of the Fine Art building in Earley Gate.

- Psychology building. Psychology also generate clinical waste, however this is very small in quantity and is collected on an ad-hoc basis as requested by users.

- Russel/Wager buildings. Waste producers are to sealed leave waste containers in their laboratory.

5.2 Biological and GM waste

All waste from hazard group 1 and 2 biological agents should be disposed of following the specific project risk assessment written in conjunction with the University Sub-Committee for Biological Safety. For waste producers the general procedure is as follows:

- Liquids: The procedure for the disposal of liquids containing Biological or GMO waste depends on the class of the organisms:

    - Hazard Group 1/ Class 1: Liquids can be disinfected with an appropriate chemical disinfectant and disposed of to drain. Alternatively liquids may be autoclaved before disposal to drain. Each biocide selected for cleaning (where biological agents have been used) is checked for efficacy in accordance with the manufacturer's safety data sheet, which lists what pathogens will be destroyed by the disinfectant. The safety data sheet for a product also describes disposal considerations.
    - Hazard Group 2 / Class 2: Liquids should be treated with disinfectant and transferred to an autoclave for sterilization. Sterilized liquids can be disposed of to drain. Each biocide selected for cleaning (where biological agents have been used) is checked for efficacy. The safety date sheet for a product also describes disposal considerations.
    - Virkon, Distel (Trigene), Precept or any other chlorine producing disinfectant must not be used where items are to be subsequently autoclaved. The recommended alternative is Biocleanse.

- Solids: Place any solids for disposal in a clear autoclave bag; this should then be taken by the waste producer to the disposal point, prior to autoclaving.

- Serological: Pipettes and pipette tips are to be placed pipette boot or disposal jar; this should then be taken by the waste producer to the disposal point, prior to autoclaving.

- Glass Pasteur pipettes: The use of glass Pasteur pipettes should be avoided if possible but if they must be used, they must be placed in a robust container (e.g. "sweetie jar" available from SCFP stores or dedicated pipette disposal pot). When full the jar or pot should be taken to the laboratory disposal point for sterilization before disposal.

- Sharps: All sharp objects should be placed into a sharps container before disposal via the clinical waste stream.

The waste must be contained in autoclave bags or leak proof containers and a dedicated lipped trolley used for transport.

Waste producers are to ensure that autoclave bags used for sterilisation should be clear or translucent so that incorrect items can be easily detected. Autoclave bags should be clearly labelled with biohazard. If for any reason waste must be transported to another building it must be double contained for the journey. The material being transported between buildings should always be conducted in accordance with Para 6.4-UoR Safety Code of Practice 14 Part 7 Clinical and Biological Waste (see associated documents).

- SCFP. Items which require autoclaving are placed by the waste producer into room 3-12. Items not appropriate for autoclave bags, e.g. glassware, are placed into trays with details of the waste producer and agent attached by sticker. Filled autoclave bags are also placed inside room 3-12.

- Hopkins building. Items which require autoclaving are left by the waste producer in one of two collection points, located on the first and second floors. TS staff will collect these items as required and transport them in a containment trolley to the autoclaving room, G03.

- Knight building. Waste producers are to place items which require autoclaving into a clear autoclave bag inside an orange trug or metal stand within the labs; or directly onto a trolley in Central Science Services (CSS). The items are then collected from the lab by TS staff and taken to the CSS on the ground floor.

- Harborne/Lyle buildings. Waste producers place items requiring autoclaving in rooms 142 and ICMR in the Harborne building; and room 176 in the Lyle building; the items are then transported to the Media Kitchen by TS staff.

- Russell building. Items which require autoclaving are placed in an autoclave bag or container and taken to room 10 on the ground floor by the waste producer.

- APD building. Items which require autoclaving are to be left in labs for TS staff to collect. APD main building has floor standing autoclaves in GU35 and 1U36, both for waste disposal and sterilization.

5.3 Chemical (Hazardous) waste

Once designated as waste, it is imperative to dispose of any waste chemicals promptly as there is a one year limit on on-site storage of waste. All chemicals for disposal should be labelled with the correct yellow sticker (obtainable from stores). Waste chemicals are to be placed in designated areas within relevant

buildings by TS staff. This waste will then be moved by Technical Services Logistics Manager (LM) to the relevant storage facility.

All waste chemicals are to be disposed of by SELECT Environmental Services, in consultation with LM and must be accompanied by a **fully complete and accurate** SELECT Hazardous Waste Return (see associated documents or contact LM). Relevant TS staff are responsible for the completion of this document and will be directed to do so by the LM when pertinent.

Waste chemicals are to be placed in designated areas within relevant buildings by TS staff. This waste will then be moved by LM to the relevant storage facility.

- SCFP. Chemicals are placed in a standard supplier box and separated according to their chemical classification by the waste producer. The waste producer then fills out the SELECT Hazardous Waste Return with all the chemicals in each box; one copy is placed into the box while the other is send to the LM. Once notified, the LM will organize the move of the box. In the interim period between collection and disposal, the box will stored in an appropriate location.

- Hopkins/Harborne/Lyle/Russell/Wager/Archeology/APD buildings. Chemicals are placed in the designated plastic boxes located at designated areas on each floor. Prior to placing a waste chemical in a box, the waste producer must complete the yellow label (available from stores) with the appropriate information and attach it to the chemical's container. The waste producer must then update the SELECT Hazardous Waste Return accordingly.

- Knight building. Waste producers are to contact a member of TS within the Knight building, who will issue a key to the chemical waste store.

5.4 Solvents in all areas except SCFP

Waste producers are to label the waste containers according to the relevant chemical classification (halogenated; non-halogenated; aqueous; acidified) and place them in the designated fume cupboard.

- Halogenated solvents. Halogenated refers to a chemical compound or mixture that contains halogen atoms, i.e. fluorine, chlorine, bromine, or iodine. Bonding to carbon the halogens form a class of compounds called covalent halides, i.e. they are not electrolytic in nature.

- Non-Halogenated Waste. Organic solvents that do not contain fluorine, chlorine, bromine, or iodine.

- Aqueous waste. Predominantly water based, where water has been used as the solvent to dissolve a substance(s) e.g. toxic compound toxic to the environment.

- Acidified. Non-halogenated solvent mixture with a flash point below 55 degrees C, and a pH of below 6 following the addition or reaction with a known inorganic or organic acid.

5.5 Laboratory consumables

All waste that has POTENTIALLY come into contact with contaminants should be disposed of as contaminated waste. Therefore any boxes or other packaging that has sat on the bench (and all glove boxes) are to be considered as potentially contaminated and disposed of via the relevant waste stream described in Para 5 to this document.

In all other laboratories non-contaminated laboratory waste is disposed of in black bin bags, which are placed into the general waste skip by Cleaning Services (CS).

- Winchester Bottles

    - The preponderance of empty Winchester bottles is generated by SCFP. SLS Honeywell Winchester bottles are placed in the cage located outside the Logistics Chemical Store1 - these are collected by Tradebe on a fortnightly basis. All other Winchester bottles are placed in the glass bottles recycling bin. All bottles are to be washed by the end user with the label scrubbed out, leaving the original content name unreadable. SBS and SAGES have their own bottle recycling bins located outside the relevant buildings; however, SLS Honeywell and Fisher will provide bespoke recycling bins for Winchester bottles in these locations.

- Plastic Solvent Containers

    - The preponderance of empty plastic solvent containers is generated by SCFP. SLS Honeywell plastic solvent containers are placed in the large cage located at the loading bay outside the Logistics Store. These are collected by Tradebe on a fortnightly basis. SBS and SAGES use their own empty containers for chemical waste stowage; however, if and when needed arises, they will collect a required amount of the containers from Logistics cage. All containers are to be washed by the end user with the label scrubbed out, leaving the original content name unreadable.

5.6 Glass

Non-contaminated broken glass.

- Non-contaminated broken glass should be placed in a bin, clearly marked "Broken Glass", or in a pigeon box, and emptied into an external general waste bin by the waste producer.

Contaminated glass.

- Biological. Glass contaminated with a biological material should be placed in an autoclave tin/bag (as designated under existing local procedure) and placed at a designated disposal point. This will then be autoclaved before disposal. If the glass is contaminated by hazard group 2 or class 2 organisms then the glass should be soaked in Biocleanse before placing in an autoclave tin ready for autoclaving and final disposal.

- Chemical. Decontamination of glassware, including the discard of any effluent waste produced as a result, is to be carried out in accordance with the chemical safety data sheet and Appendix 2. The glassware is then placed into a SELECT drum at a designated disposal point.

Following decontamination, the glass will be placed into an external general waste bin by TS.

5.7 General and Uncontaminated laboratory waste

All general waste may be discarded by waste producers directly into grey/black bins which are located outside buildings, for 'energy recovery', or in accordance with recycling procedures.

Paper towels and plastic wrappers can be placed in the Grey laboratory bins (by the sinks in most labs) which are emptied by CS. Non contaminated cardboard boxes (i.e. boxes that have not come into contact with work areas) should be flattened and placed in the blue bin at the relevant recycling point by the waste producer/CS. Care should be taken not to put uncontaminated laboratory waste in these bins.

All laboratories designated as containment Level 2 or above, all uncontaminated waste should be disposed of as biological waste. For guidance, waste producers should refer to Para 5.2 in this document.

In all other laboratories, uncontaminated laboratory waste can be disposed of directly to the waste skip in black sacks by the waste producer/CS.

5.8 Food waste

Food waste is to be contained in black bags and placed into grey/black bins by the waste producer. Requests for large food waste collections should be directed to Sustainability Services, and in consultation with the LM.

5.9 Soil waste

Soil waste is produced in the Russell building and can be separated into 'foreign or contaminated' and 'non-foreign or non-contaminated' categories.

5.10 Local contacts for waste disposal

In the first instance, the LM is to be contacted regarding waste disposal. In the second instance, the relevant H&S Co-ord should be contacted.

6 Associated documents

6.1 University of Reading Safety Code of Practice 48 Hazardous Waste (H&SS)

6.2 University of Reading Safety Code of Practice 14 Part 7 Clinical and Biological Waste (H&SS)

6.3 University of Reading Safety Code of Practice 18

6.4 University of Reading Safety Code of Practice 19

6.5 SELECT Hazardous Waste Return

6.6 CLP EC 1272/2008

6.7 UK Trade Effluent (Prescribed Processes and Substances) Regulations 1989

7 Training

All new members of staff, postgraduate students and undergraduate students working in research laboratories must receive training in waste disposal procedures as part of their induction. All staff and students are to be made aware of waste disposal procedures and any specific procedures required under area risk assessments. This training is carried out by the relevant H&S Co-ord.

All new cleaning staff must be trained in the correct procedures for their role within the laboratory and shown which bins it is their responsibility to empty. This training is carried out by the relevant Cleaning Services supervisor