DEPARTMENT OF

Plant Sciences

# Induction Manual

# Information about the Department & Health and Safety Handbook 2024/25

Athena SWAN Bronze Award

Please ensure you have set up your Raven log in. You need your Raven log in to access some of the links in this document.

Reception will provide you with a temporary access card. If you are with us for more than 6 months a photo ID card will be ordered for you. It may take a few days for your card to arrive so please send reception your photo as soon as possible. If you cannot provide a photo, we can take one at reception for you.

Please complete the online acknowledgment form at the end of this document.

Change Record

| Date | Pages | Changes made | Changes by |
|---|---|---|---|
| | 6 | Updates to Key Contacts | MB |
| | 9 | Reception hours updated | RB |
| | | Tea Room hours updated | MB |
| | | Information regarding library computers and software removed | FM |
| | 10 | Postage information updated | RB |
| | 13 | Visitor information updated | RB |
| | 14 | Reference to University's *Children and Adults at Risk Safeguarding Policy* added | MB |
| | 17 | Travel safety information updated | MB |
| | 18 | Details of Online Cyber Security Training and University's Acceptable Use Policy. | SP |
| | 38 | Pregnancy information updated | MB |
| | 41 | Risk Assessment information updated | MB |
| | 42 | Reference added to ban on mercury thermometers | MB |
| | 48-66 | Waste Policy updated | MB/AG |
| | 68 | Induction section added | MB/SSG |

# Section 1

# General Information for the Department of Plant Sciences

# 1 Welcome

Welcome to the Department of Plant Sciences in Cambridge. The Department carries out world-leading research into fundamental plant processes that sustain life on earth, and also provides undergraduate and postgraduate teaching in plant-related subjects across the University. Our work is focused on contributing solutions to challenges such as food security and conservation of biodiversity, by growing a more sustainable bioeconomy. Each year we welcome new postgraduate students, members of the professional services staff, postdoctoral researchers, academic visitors, research fellows and academic staff – whatever your role or position, I am sure that you will make a valuable contribution to the work that goes on here.

Safety is of paramount importance and much of this guide will be an important reference for ensuring that everyone who comes to the Department is safe. There are no longer any formal restrictions relating to COVID-19, but in terms of communicable diseases in general please be thoughtful and considerate to others. Take the time to read the safety information and discuss any queries you have with your supervisor.

I hope very much that you enjoy your time here, and that you make the most of the vibrant and exciting scientific community in Cambridge. We pride ourselves on being a friendly and supportive place to work, holding an Athena Swan Bronze Award for Equality and Diversity, and we encourage you to participate in the life of the Department as much as possible.

Julian Hibberd

Head of Department

# 2 Departmental Information

## 2.1 Orientation and Access

### 2.1.1 Map

You can find a map of the department on Downing Site here

### 2.1.2 Opening Hours

All gates to the Downing Site are locked at night and the opening times are:

| | |
|---|---|
| Mon-Sat | 0630 - 2200 |
| Sun | 0830 - 1730 |

The gate to Downing College opens 1000 – 1600 only.

There are five entrances to the department, and for reasons of safety and security these are normally kept locked.

The two front doors are normally unlocked at the following times:

| | |
|---|---|
| Mon-Fri | 0830 - 1700 |
| Sat (term-time only) | 0845 - 1215 |

Access can be gained to the department by card holders at all other times using the central rear door. Normal working hours are 0800 to 1800 Monday to Friday. See section 2.5.7 for out of hours working.

## 2.2 Contact Information

### 2.2.1 Contact Details

The departmental contact information is:

Department of Plant Sciences
University of Cambridge
Downing Street
Cambridge
CB2 3EA
Tel: 01223 333900; Fax: 01223 333953;
email: reception@plantsci.cam.ac.uk

### 2.2.2 Research Groups

The department currently contains 24 research groups spread throughout the Downing Site building, Crop Science Centre, and the David Attenborough Building on the New Museum site.

### 2.2.3 Key Contacts

These are some of the key departmental staff along with their room number, internal telephone numbers and emails. All emails are either in the format abc1@cam.ac.uk or title@plantsci.cam.ac.uk.

| Role | Name | Room | Extn. | E-mail |
|---|---|---|---|---|
| Head of Department | Julian Hibberd | 102 | 66547 | hod |
| Departmental Administrator | Catherine Butler | 127 | 33909 | cek31 |
| Deputy Departmental Administrator | Del Hawtin | 124 | 33916 | accounts |
| Research Grants & Accounts Coordinator | Angie Claxton | 124 | 33916 | accounts |
| Purchasing Manager | Daniel Arnold | G14 | 33910 | stores |
| Computing Officers | Shaun Prince<br>Vincent Fernandez Gonzalez | 314 | 33950 | computing |
| Reception | Becky Browning | G11 | 33900 | reception |
| Postgraduate Administrator | Heather Bell | G17 | 61759 | pg.admin |
| Undergraduate Teaching Administrator | Katherine Maltby | G17 | 66519 | ug.admin |
| Chief Teaching Technician | Barbara Landamore | G15 | 33927 | bmb10 |
| Equality, Diversity and Inclusion coordinators | Julian Hibberd<br>Catherine Butler | 321<br>127 | 33954<br>33909 | jmh65<br>cek31 |
| Catering Assistant | Annie Lu | 111 | 66532 | ayl21 |
| Principal Technician | Anna Gordon | 112 | 33947 | ag2343/facilities |
| Facilities Manager | Simon West | B3 | 33929 | facilities |
| PGF Manager | Nigel Boulding | PGF | 67820 | nab59 |
| Departmental Safety Officer | John Carr | 120 | 66416 | dso |
| Biological Safety Officer | Martyn Balmont | 213C | 60980 | bso |
| Radiation Protection Supervisors | Martyn Balmont<br>John Carr | 320<br>120 | 30223<br>60980 | safety<br>jpc1005 |
| Laser Safety Officer | Facundo Romani | 208 | 66545 | fr391 |
| Departmental Safety Manager | Martyn Balmont | 320 | 30223 | safety |
| Fire Manager & Security | Anna Gordon | 112 | 33947 | ag2343/facilities |
| Crop Science Centre | | | | |
| CSC Safety Officer | Uta Paszkowski | | | up220 |

| | | | | |
|---|---|---|---|---|
| CSC Deputy Safety Officer | Susana Sauret-Gueto | | | ss2359 |

### 2.2.4 First Aiders

The following are qualified first aiders within the department.

| Name | Room | Extn. / Mobile |
|---|---|---|
| Barbara Landamore (Chief First Aider) | Teaching | 33927/ 07870307871 |
| Tomasz Dyl | Stores | 33910 |
| Matthew Stancombe | 201 / Teaching | 33927/28/ 07542302469 |
| Susan Stanley | 101 | 30220/ 07542302470 |
| Stephanie Topp | 303 | 48979/ 07707288199 |
| Martyn Balmont | 320 | 30220/ 07783153620 |
| Nigel Boulding | PGF | (7)67820 |

### 2.2.5 Internal emergency telephone numbers:

University Central Security: (3)31818 (routine calls) or (7)67444 (emergency calls)

Plant Sciences Reception: (3)33900

For serious injuries dial 999 for an ambulance so that the person can be taken to Addenbrooke's Hospital.

Other than ambulance cases, transportation to hospital can be provided by:

1. During normal working hours: A First Aider will call for a taxi
2. Outside normal working hours: If a First Aider is not available, telephone Central Security on 31818 who will call for a taxi.

### 2.2.6 Other useful emergency telephone numbers

| | **Phone Number** |
|---|---|
| NHS 111 service | 111 |
| Ambulance, Fire Brigade, Police<br><br>NB. Emergency service number 1999 can be called on any handset within the Department | 999 |
| Accident and Emergency Department, Addenbrooke's Hospital, Hills Road, Cambridge | 01223 245 151 |
| Cambridge Water Company | 01223 403 000 |
| Southern Electric | 0800 783 8838 |
| Cadent (Gas) | 0800 111 999 |
| Occupational Health, 16 Mill Lane | Extn 36594 |

## *2.3 Facilities & Services*

If you have any problems, difficulties or queries about Plant Sciences facilities contact the Principal Technician, who is always happy to help and to improve services within the Department.

### 2.3.1 Reception

During term, Reception is open Monday to Thursday 8.30-4.30 and Friday 8.30-3.30. Out of term, Reception is open Monday to Thursday 8-4 and Friday 8-3. Lunch is covered during term times and closed out of term. Reception deals with general enquiries, programming access cards, franking post, room bookings, the department website.

### 2.3.2 Stores

Opening times for withdrawing goods from stock are 0900-1200 and 1400-1600 on weekdays. Your grant or group code will be required when ordering. Please have the exact details of your requirements.

### 2.3.3 Accounts

Accounts provides full support for all aspects of the Departmental Finances. Also responsible for issuing access card and keys (deposit required).

### 2.3.4 Tea Room

Refreshments are for sale in the Tea Room, Mon-Fri 10.00-11.30 and 15.00-16.00. Please do not enter the kitchen during these times. A canned drink machine, a hot drink machine, cold water tap, fridge and microwave are also available for staff to use. If you use the fridge, please make sure you write your name on anything you put in it. Unnamed food gets thrown out weekly. No food or drink is allowed in the laboratories or offices accessible by laboratories.

### 2.3.5 Library

The Plant Sciences Library is open 24/7 for current members of the Department and undergraduate students taking Part II Plant Sciences.

The library offers a range of services, including:

- access to plant sciences books and print resources
- access to electronic resources including journal articles, databases and ebooks
- undergraduate and postgraduate skills training
- online reading list support
- research support, including open access and data management
- in-depth literature searching
- referencing support and troubleshooting
- interlibrary loans and Scan and Deliver requests
- copyright support
- a space to work with wi-fi throughout and docking stations available

Frankie Marsh is the subject specialist librarian located within the Department of Plant Sciences and can help you with any of these library services and more. You can find her in the Library on

Tuesdays and Fridays but she works at the Cory & Herbarium Libraries on other days so it is often easiest to contact her via email: plant@lib.cam.ac.uk.

### 2.3.6 Communication

#### Post

Outgoing post (UK addressed post can be letters, large letters and small parcels and International is letters and large letters only) is sent through the Reception Office. All mail is sent 2nd class unless otherwise requested. Mail is charged to the Group or to a Research Grant. Please specify Research Grant or Group to be charged. Mail to be posted should be placed in the trays provided outside Reception by 2.00pm.

Incoming post will be put in your Group's pigeonhole outside the Tea Room.

#### Email

You can find current department members emails on our website or via the University Look Up Service. All emails are in the format abc12@cam.ac.uk. Ask at Reception to apply for an email if you have not had one set up already.

#### Phones & Teleconferencing

All telephone extensions within the Department are on the University network. They can be telephoned free of charge from other network extensions using the 5-figure numbers listed.

Local telephone calls on official business can be made from Group laboratory telephones but check first with the technical assistant in charge or Group leader. You need to prefix the number with a 9 to dial out of the network. If you need an international number call reception (33900). There are no public pay phones in the Department. In the event of an emergency occurring while the main Ethernet telephones are not working there is an emergency (red) BT phone in Reception with six pre-programmed numbers (see phone for list).

If you need a conference phone there is a bookable one in reception.

#### Fax

The Departmental Fax Number is 01223 333953. The Fax machine is in Room 124. Please write your name and grant or group number on the sheet provided when you send faxes. All use is billed at cost.

Incoming faxes will be put into your Group's pigeonhole outside the Tea Room.

### 2.3.7 Photocopying, Printing & Scanning

You can print, photocopy and scan from the machine in the library and the one by the Tea Room (room 113). Go to room 124 to have credit added or You can buy credit online here. If you need your device to be connected to the print service, contact computing@plantsci.cam.ac.uk

### 2.3.8 Plant Growth Facility and Botanic Garden

The dedicated Plant Growth Facility (PGF) within the Botanic Garden provides controlled environment capabilities and containment facilities for plant pathogen work. There are also both glasshouse and outdoor plots for horticultural and ecological studies. All users must be approved by the Biological Safety Committee (BSC) and abide by the Biological Safety Committee: Code of Practice. You will also receive an induction from the PGF Manager and must complete an online training course, which can be found in the PGF channel on Teams.

Some research groups have growth cabinets that have been acquired through grant applications. They retain full control of these facilities while the grant is in operation, but at times when they are not required space may be granted to workers from other groups.

Extensive greenhouses and open land are also available at the Botanic Gardens which is part of the Department. To book space in the Botanic Garden's glasshouses or outdoor field plots contact experimental@botanic.cam.ac.uk.

Plants and other materials must be transported in the sealed containers provided, using the shuttle van operated by Facilities. Each item transported must be accompanied by a description using the forms provided. Book space on the shuttle van by emailing van.runs@plantsci.cam.ac.uk

Limited space may be available in two greenhouses located on the Plant Sciences Building roof.

Students have free access to the Botanic Garden with their Student ID card. Staff and visitors on long term assignment (9 months +), excluding TES (Temporary Employment Service), can apply for a free Botanic Garden Pass by filling in Form C attached to your Welcome email or as a hard copy from Reception.

### 2.3.9 Energy and Environment

Departmental research and activity has a large environmental footprint. As a responsible organisation, Plant Sciences has an obligation to minimise its negative impacts on the environment. Please read our Energy & Environment Policy.

## *2.4 Travel & Parking*

### 2.4.1 Parking

The Plant Sciences department is a prominent part of the Downing Site in the centre of Cambridge. Staff, students, and visitors are strongly encouraged to walk, cycle, and use public transport. A PDF of travel options to the Downing Site is available here.

Car parking in central Cambridge is exceptionally difficult, and space on university sites is restricted. Research students and undergraduate students are not granted parking badges except on medical grounds, and University employees are not automatically entitled to free parking spaces.

Further information and advice on parking regulations within the University is available from Reception.

### 2.4.2 SBS (School of Biological Sciences) Vehicle pool

The School of Biological Sciences Vehicle Pool has been set-up to provide users within the school access to a range of vehicles to suit their needs, co-ordinated through one department (Biochemistry), with the aim of providing an efficient and effective service.

### 2.4.3 Universal Bus

The Universal bus service (run by Whippet) links Eddington with West Cambridge, the city centre (Queens College/Silver Street), the railway station and the Cambridge Biomedical Campus (including Addenbrookes), running every 15 minutes Monday to Friday.

On Saturdays buses run every 20 minutes from Eddington via West Cambridge, the city centre (Queens College/Silver Street) to the railway station. Sunday buses link Eddington via West Cambridge, the city centre (Queens College/Silver Street) to the railway station up to every 30 minutes. Discounts apply for University card holders; show the driver your card

## *2.5 Working Guidance*

### 2.5.1 Code of Conduct

The Department is noted for its friendliness and ability to integrate staff and students into its community. Staff and students alike are expected to adhere to the University's policies on dignity in the workplace. For students, these are enshrined in the Breaking the Silence Student Policy and for staff the Dignity @ Work Policy.

As a place of learning, teaching and research, the University provides an environment in which to exchange ideas, opinions, and views. The University is committed to maintaining a learning and working environment in which the rights and dignity of all members of the University community are respected.

The University expects all members of its community to treat each other with respect, courtesy, and consideration at all times. All members of the University community have the right to expect professional behaviour from others and have a corresponding responsibility to behave professionally towards others.

We therefore expect behaviour to be appropriate. Behaviour is defined as inappropriate if:

- it is unwanted by the recipient
- it is perceived by the recipient as violating their dignity and/or creating an intimidating, hostile, degrading, humiliating or offensive environment
- the behaviour could be considered as having that effect having regard to all the circumstances, including the recipient's perception.

These definitions apply whether there was an intention to cause the effect.

Inappropriate behaviour may include several specific behaviours - such as bullying, or harassment on account of sex (including gender reassignment), race, ethnic or national origin, colour, disability, sexuality, religion or belief, or age. Also, behaviour that may appear trivial as a single incident can constitute harassment or bullying when repeated.

We will always take breaches of the code seriously. If you think that you have been treated inappropriately, please contact your supervisor (including at college) or other staff member. Staff may also wish to contact a Dignity @ Work advisor.

Following this code of conduct helps ensure equality of opportunity and a secure environment in which everyone can do their best.

### 2.5.2 Radio, Headphones, Telephones

Radios and other audio equipment may be used only if nobody is disturbed by the noise. Anyone who objects to the playing of audio equipment may switch the equipment off. Staff and students are expected to be sensible regarding mobile phone use while at work. It is recognised that sometimes urgent calls and messages may need responding to, but using your phone frequently for personal calls, texts, games, internet browsing etc during work time is not permitted, and is disruptive for your colleagues. Mobile phones and personal audio equipment should not be used while walking through the Department, especially while traversing stairs.

### 2.5.3 Visitors

**Short-term**

If you are expecting visitors, please email or let Reception know in advance and ask your visitor on their arrival to report to Reception. You should arrange for someone to be available to collect them. Visitors should not be taken into the laboratories unless it is for the specific purpose of discussing the scientific work in progress. If visitors are taken into the labs they must be provided with the appropriate personal protective equipment. No one under the age of 18 years must enter a lab, unless on an agreed work experience program.

If you require parking for a 'one-off' visitor, please speak to the Gate Porter. He requires the car make/reg number and estimated time of arrival and departure. Please try to discourage visitor parking.

**Long-term**

Longer term visitors, or those involved with work in laboratories and workshops, are required to register in the Department and to follow the University and Departmental Safety regulations. If you are expecting a long-term visitor, use visitors@plantsci.cam.ac.uk to let administrative staff know.

**ALL VISITORS MUST READ AND ABIDE BY THE DEPARTMENT'S INDUCTION HANDBOOK; THEY MUST ALSO READ ALL RELEVANT SAFETY DOCUMENTATION.**

It is the responsibility of the visitor's Supervisor or contact to ensure that:

1. The visitor is informed of the fire and emergency arrangements.
2. The visitor is given the results of any existing risk assessments, advised of the control measures and systems of work, and informed of any residual hazards.
3. The equipment to be used by the visitor is in a safe condition and that the visitor is competent to use it safely.
4. The visitor is provided with any personal protective equipment that is required and shown how to use it.
5. The visitor uses the protective equipment correctly and maintains it in efficient working order.
6. The visitor conducts their business in a safe manner in compliance with any University, Departmental or local rules. This may include assisting the visitor to undertake risk assessments where they are unfamiliar with the technique.

The DSM **must** be informed of **all** long-term visitors, including those who intend to undertake experimental work within the Department.

### 2.5.4 Children

**CHILDREN UNDER 18 ARE NOT PERMITTED INTO LABORATORIES WORKSHOPS OR GROWTH FACILITIES UNLESS ON AN OFFICIAL WORK EXPERIENCE PROGRAM.**

Children (under 18) visiting the Department must be always under the immediate and close supervision of a responsible adult.

Any persons who are planning to bring children or vulnerable adults into the department for visits, work experience placements or apprenticeships must ensure they are familiar with and adhere to the *University's Children and Adults at Risk Safeguarding Policy.*

### 2.5.5 Unauthorised Persons

Unauthorised persons are not allowed access to workshops or laboratories and may not use tools, offices or other equipment wherever situated in the Department. An unauthorised person is someone who does not have authority, expressed or implied, by appointment or position, to be in the area in question. A member of the Department, like any other visitor or person legitimately on university premises, may be an unauthorised person if they are in a part of the premises where they have no legitimate reason to be.

### 2.5.6 Lone Working

**LONE WORKING IS NOT PERMITTED IN LABORATORIES; THERE MUST BE AT LEAST ONE OTHER PERSON WITHIN EASY CALL IN THE EVENT OF A MISHAP**

There are situations when a researcher may need to undertake an activity out of hours whilst unaccompanied (e.g. watering plants/circadian rhythms) either during or outside normal working hours. In these situations, a risk assessment **must** be undertaken. This will need to address the inherent risks which are further exacerbated by lack of support. The risk assessment must:

- Identify the hazards associated with the work and carrying it out unaccompanied.
- Assess the risks associated with the work and decide on the working arrangements to control these risks.

The assessment should take account of the fact that a lone worker is more vulnerable when the unexpected happens. The assessment should also identify foreseeable events and appropriate emergency procedures should be established.

The findings of the assessment **must** be recorded, and the safe working arrangements identified in the assessment **must** be implemented. The safe working arrangements **must** be subject to regular monitoring and review. All relevant individuals should be made aware of the risk assessment and receive training in the safe working arrangements and emergency procedures.

### 2.5.7 Out of Hours Working

When the gates to the site are closed use the buzzer located on the main gate to speak to Security or ring them on 339513 or 331818.

Regulations governing the use of Departmental facilities *outside* normal working hours are as follows:

1. Working in the Department between 18.00hrs and 08.00hrs Monday to Friday and at any time on Saturday and Sunday is **only** allowed if the activity is not hazardous. Anyone working in the Department must know that there is at least one other person within easy call in the event of a mishap or they must have arranged with somebody to be at the end of a telephone.
2. All persons **must** use the Signing In/Out book located in the central stairwell on the ground floor, when they enter/leave the building after 18.00hrs on Monday to Friday, and any time on Saturday or Sunday. Persons already in the building at the commencement of these periods **must also** sign in.
3. A permit must be completed by everyone working out of hours. This can be found in

the University's Working Out of Hours (WOOH) Guidance.

### 2.5.8 Hybrid Working Policy

The Department of Plant Sciences supports hybrid working options for all its staff. Cambridge University approved a new Hybrid Working Policy in April 2023, which formalised an ongoing approach to working practices since the pandemic. The policy was developed following engagement sessions and a University-wide consultation involving more than 3,500 staff. It aims to enable as many staff as possible to work in a hybrid way if they wish, whilst recognising that some roles include tasks that can only be performed on University premises. It highlights that consideration should be given to the possibility of occasional remote working, even if only a few tasks in an individual's role can be performed in this way.

An updated version of the University's Flexible Working Policy has also been approved. The updated version sets out the relationship with the Hybrid Working Policy, contains an improved process for making a flexible working request, and includes information about appeals relating to flexible working applications.

The Department has been working in a hybrid way since 2020 so the new policy has not changed our practice. Staff are encouraged to discuss and agree their working arrangements with their line managers. If any queries arise, please speak to either Catherine Butler, Department Administrator (cek31@cam.ac.uk), Katrina Wilson, HR Co-ordinator - Downing Site (kjw63@cam.ac.uk) or Edelmira Bell, HR Co-ordinator – Crop Science Centre (eb788@cam.ac.uk)

### 2.5.9 Theft

It is the responsibility of all individuals working within the Department to reduce to a minimum the likelihood of theft, and to reduce to a practical minimum the loss should a break-in occur. This can be done by:

1. Ensuring that all doors and windows are locked securely whenever rooms are unoccupied, and especially outside normal working hours.
2. Marking all expensive items such as computers, printers etc. in an indelible way to reduce their saleable value.
3. Fitting loop alarms to expensive pieces of equipment, especially computers.
4. Keeping valuables out of sight whenever possible. Do not hang coats and jackets, place bags and cases near doors. It should be noted that personal property is not covered by university insurance.
5. Reporting sightings of any stranger, furtive/suspicious behaviour to the University Security Control Centre (31818).

### 2.5.10 Maintenance and Broken Equipment

To request assistance, notify the technician in your group, and then email facilities@plantsci.cam.ac.uk with the relevant paperwork. Forms for requesting maintenance and/or repair, or decontamination are available here.

Maintaining equipment costs the Department tens of thousands of pounds a year. It is vital that everyone uses all equipment carefully and only after proper instruction. When a piece of equipment breaks down you should follow the procedure below:

1. Decontaminate the equipment
2. Label the equipment as faulty
3. Report the problem to the Group Technician or HoG.

The Group Technician will arrange for the equipment to be repaired. The Workshop will look at most items first to check if the fault can be remedied in the Department. If an engineer must be called the Group Technician will ask the Principal Technician for authorisation. As funds are limited only authorised callouts can be paid for from departmental funds; unauthorised call outs must be paid for from group funds.

If the Group technician is unavailable and a piece of equipment fails, please see the Principal Technician directly. You should not call an engineer yourself unless you have the Principal Technician's explicit permission and have been given a purchase order number. If both the Group Technician and the Principal Technician are away, you should approach the Facilities Manager for help.

### 2.5.11 Computing Support and Software

The department has its own computing support team, based in room 314. Requests for support should be logged using the email computing@plantsci.cam.ac.uk and someone will get back to you as soon as possible.

The Department has an agreed policy on the use of software for computers which it expects all researchers to adhere to. Anyone who refuses to comply with the policy or requests to do so will be denied access to Departmental machines and networks until such compliance is assured.

All software on any computer used in the Department must have a licence and must not be illegally copied.

Heads of Groups are responsible for software use in their Group, although they may choose to delegate the authority for implementing this.

If you own copies of programs, you should report them to the computer liaison person in your group and act upon their guidance. You should not place any software on machines, even freeware, without notifying the group's computer liaison person.

You should not place games on the departmental machines.

Computer software held on all machines in the Department is continually monitored on behalf of the Departmental Administrator. You should be prepared to produce your licence and/or manuals for any software you have put in the machines within a month of the request from computing staff.

The University runs a Cyber Security Awareness Training program which all users should complete annually.

Use of department computers should be done so in line with the Universities Acceptable Use Policy and System Management Policy which can be found at https://help.uis.cam.ac.uk/policies

The UIS or Department IT Team may disconnect devices or users that fail to comply from the University Network.

If you have any queries about the operation of the policy, please do not hesitate to seek advice from the Computer Officer.

### 2.5.12 Experiments left unattended

It is accepted that experiments, apparatus, and computers may have to be left running overnight.

Equipment may only be left running overnight if it is safe to do so. All equipment that is left running unattended must be designed to 'fail to safety' if sudden loss of mains services (water, gas, electricity) should occur; care must be taken to avoid dangerous situations developing when lost services are restored. Emergency shutdown procedures as well as an emergency contact name and number must be available.

A residual current device (RCD) should be utilised between the electrical plug and socket for pieces of equipment left running overnight where there is a possibility of floods producing an electrical hazard.

Precautions should also be taken to avoid flooding caused by faults in water cooling circuits, such as perished hoses. Such precautions include regular inspections of all components, replacement of perished pipes; the use of materials that are not likely to be subject to rapid deterioration; and the use of appropriate clips. If any flood should occur the persons attending to the problem must be aware of the possibilities that flood water may have penetrated electrical circuits and the electrical supply to the area must be isolated before entering to begin remedial work.

### 2.5.13 Working away from Cambridge (field trips and travel)

Work away can be defined as any activity undertaken by students or staff as part of their academic work away from Cambridge. It can range from attending short meetings in the UK to working in Tropical Rain Forests for a year or more. For students it is normally planned, but not necessarily supervised, by a member of staff. A risk assessment must be completed for all work away from Cambridge. Information is available from your supervisor, the Departmental Administrator, DSM, the department intranet site https://www.plantsci.cam.ac.uk/intranet/health-and-safety/risk-assessments/field-trips and the Safety Office Travel for Work | Safety Office(cam.ac.uk)

### 2.5.14 Insurance

The department (including visitors) is covered by Employers Liability insurance.

If you are using your own vehicle for a work trip, transporting yourself and/or colleagues, your personal car insurance policy must include business use. If you are hiring a vehicle for a work trip, you should take out business insurance with the hire company. You must take out University travel insurance for all work trips outside the UK, whether fieldwork or conferences.

### 2.5.15 Preventing Communicable Disease Transmission

During the COVID-19 pandemic, in line with University and UK Government guidance and legislation, the department put in place measures to help prevent the spread of the virus between department members, students and visitors. It is recognised that, while the specific legislation for COVID-19 has been removed, the risks associated with the spread of SARS-CoV-2 and other respiratory communicable diseases remain.

Therefore, the department continues to implement strategies to help prevent the spread of such diseases as far as possible and thereby reduce the risk to the health of its members,

particularly those who are at increased risk of complications resulting from an infection. We ask that everyone exercise personal judgement and a shared sense of responsibility to help keep everyone in the department safe.

The '*Workplace Protocols'* document that was in circulation during the pandemic has been withdrawn and replaced with this section. It should be stated that in the event of another pandemic or serious outbreak, COVID-19 or otherwise, the guidance set out in this section may be superseded by stricter measures. These would be clearly communicated when required.

- Hygiene and handwashing

  Maintaining rigorous personal hygiene is an important step in controlling the spread of communicable diseases. Handwashing facilities and hand sanitiser bottles are available throughout the department and members are strongly encouraged to make use of these throughout the working day.

- Ventilation

  The importance of effective ventilation in the prevention of the spread of communicable respiratory diseases can not be overstated. Where possible, when working in shared spaces and meeting rooms, windows and doors should be opened to allow for effective ventilation. In colder months, windows do not need to be opened as wide as in warmer months and, if temperature is a concern, open higher windows where possible. Where it is not possible to utilise natural ventilation, HEPA filtration units are provided and should be used when working with others.

- Meeting rooms

  When booking a meeting room, department members are strongly encouraged to book the largest space available, providing the opportunity for attendees to socially-distance from others if they wish.

- Individuals at increased risk of severe illness from respiratory infections

  All individuals who are considered to be at increased risk of severe illness in response to a respiratory infection are strongly encouraged to make this known to their supervisor. For new starters, a pre-employment work health declaration is sent out which provides the opportunity to do so.

  An individual risk assessment will be completed for anyone who does declare an increased personal risk. This will identify any changes to their working arrangements that need to be made to help ensure their safety and wellbeing. Advice can be sought from University Occupational Health if required.

- Symptoms of respiratory infections

  All department members are strongly encouraged not to come into the department if they are experiencing symptoms of SARS-CoV-2 or other respiratory infections, particularly if they are experiencing a high body temperature. Where possible, individuals may be able to work from home if they feel well enough to do so. Either way, they should remain at home until they have recovered fully before returning to the department.

- University guidance

  The University COVID helpdesk is now operating as the Communicable Diseases Helpdesk. The helpdesk can be contacted by phone (01223 339514) or by email (covid-helpdesk@admin.cam.ac.uk). Published guidance on reducing the spread of respiratory

infections in the workplace can be found here:
https://www.safety.admin.cam.ac.uk/system/files/hsd097m.pdf

- Questions or concerns

Any questions or concerns regarding communicable disease transmission can be directed to the Department Safety Manager.

## *2.6 Personal Support and Development*

### 2.6.1 Postdocs and Research Staff Mentoring Scheme

Being mentored offers many benefits whether you want to develop your career as an academic or are considering a career change. The University's Postdoc Academy have a mentoring scheme that offers individualised formal matching between a postdoc and mentor. Mentors come from academia, business, and industry, but could also come from governance, administration and charities if requested.

### 2.6.2 WiSETI

WiSETI is a positive action initiative at the University of Cambridge that promotes and supports women from Undergraduate level to Professor, in the Science (including Clinical Sciences), Technology, Engineering and Mathematics (STEM) subject areas. WiSETI was established in 1999 and aims to redress an under-representation of women in employment and career progression in these disciplines at the University of Cambridge.

### 2.6.3 Personal Professional Development

PPD (Personal and Professional Development) deliver practical and relevant development opportunities to the staff and research students. The training and development they offer supports the primary purpose of the University: to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence. They work with staff and research students at the University and with development professionals in the research, design, delivery and evaluation of training and development.

### 2.6.4 Athena Swan

The Athena SWAN Charter was launched in June 2005 to recognise and reward commitment to advancing the careers of women working in higher education in science, technology, engineering, mathematics, and medicine (STEMM).

Although developed to address the lack of female representation in these subjects, the activities that support the Charter will contribute towards a more positive working environment for all. The Department of Plant Sciences holds a Bronze Athena Swan award.

### 2.6.5 Springboard: A Personal Development Programme for Women

Springboard is a personal development programme for all female staff/graduate students. It will give you the opportunity to take stock and consider your personal and professional goals.

During the programme you explore your future in a practical way and learn how to develop your potential. You undertake realistic self-assessment and set challenging goals.

Key areas covered include communication skills, assertiveness, self-confidence, improving your work/life balance and developing positive skills and attitude. If you want to progress and develop, then this programme is for you.

### 2.6.6 Navigator: A Personal Development Programme for Men

Personal development is unique to everyone. It is about having time for yourself to take stock and consider your next moves. During this programme you will explore your future in a practical way and learn how to develop your potential. You will undertake realistic self-assessment and set challenging goals. Key areas covered include communication skills, assertiveness, improving your work/life balance and developing positive skills and attitude. If you want to progress and develop, then this programme is for you.

### 2.6.7 Diversity Networks

The University's diversity plays a key role in sustaining its academic excellence. These networks are helpful for making contacts outside direct work environments.

### 2.6.8 Wellbeing Advocates

The department has a team of wellbeing advocates, who are there to help signpost staff, students and visitors to services and resources of support. The also help arrange social gatherings throughout the year to facilitate a welcoming and supportive working environment. You can find further information on the wellbeing team in the Wellbeing Channel of the Departments Teams Group. If you wish to contact the wellbeing team you can do so by posting on the Teams channel or emailing wellbeing@plantsci.cam.ac.uk.

# 3 Emergencies

## *3.1 Evacuation Procedure*

On hearing the fire alarm all persons should evacuate the building by the **nearest available exit** route (follow the arrows). Before evacuating, and without taking risks, it is important to ensure that apparatus, equipment, fume cupboards and services are switched off or made as safe as possible.

Once outside, make your way to the assembly point under the arch on Downing Street.

**CLOSE DOORS AND WINDOWS**

**DO NOT USE LIFTS**

**DO NOT STOP TO COLLECT PERSONAL BELONGINGS**

**DO NOT RE-ENTER THE BUILDING**

## *3.2 Fire Procedure*

### 3.2.1 Normal Working Hours (08.00hrs - 17.00hrs Monday – Friday)

In the event of a fire and the fire alarm system not being automatically activated:

1. Immediately operate the nearest fire alarm call point - the fire alarm will be heard.
2. Only tackle the fire if you have the appropriate training, use the correct appliances provided for the type of fire, **but without taking personal risks**
3. If possible, close fume cupboard sashes, turn off gas supplies and make safe any critical apparatus and equipment.
4. Once outside the person who sounded the alarm ONLY should go to the Botany Gate entrance and report to the Fire Wardens. The Emergency Services may need to ask for details of the fire.

**CLOSE DOORS AND WINDOWS**

**DO NOT USE LIFTS**

**DO NOT STOP TO COLLECT PERSONAL BELONGINGS**

**DO NOT RE-ENTER THE BUILDING**

### 3.2.2 Outside Normal Working Hours (After 17.00hrs Monday to Friday and weekends)

In the event of a fire and the fire alarm system not being automatically activated:

1. **Call the Fire Brigade** by breaking the glass at the nearest Fire Alarm point.

2. **After you have left the building**, if you have a mobile phone, call the Fire Brigade to ensure they have received the automated call. **Dial 999** and give your name, address and state the service required i.e. FIRE. A call to the fire brigade automatically informs the Police.
3. Inform the University Security Control Centre on 01223 331818.

**DO NOT FIGHT THE FIRE ALONE**

**CLOSE DOORS AND WINDOWS**

**DO NOT USE LIFTS**

**DO NOT STOP TO COLLECT PERSONAL BELONGINGS**

**DO NOT RE-ENTER THE BUILDING**

### 3.2.3 Additional Fire Procedure Information

All persons working in the Department are expected to familiarise themselves with the different types of fire extinguisher, their location, how to use them and what to do in the case of a fire including the location of assembly points and nearest fire escape/exit routes.

When using any potentially flammable reagents the relevant extinguisher should be ascertained from the material safety data sheets. This must be done as part of the chemical hazard (COSHH) risk assessment.

The following table contains information on certain types of fire extinguisher and their use. It should be noted that in accordance with BS EN 3, all extinguishers are coloured RED with different coloured bands around the top. The band denotes the type of extinguisher.

| COLOUR CODE | TYPE | USE |
|---|---|---|
| Red cylinder marked 'WATER' or Red with white band | Water | Wood, paper, plastic fires.<br>**DO NOT USE ON ELECTRICAL EQUIPMENT OR FLAMMABLE LIQUIDS.** |
| Black band | Carbon Dioxide ($CO_2$) | Electrical fires and small bench top fires involving flammable liquids. A good general extinguisher**.**<br>**Not to be used on materials ending with the letters 'ium' e.g. potassium, sodium, magnesium etc.**<br>**DO NOT USE IN CONFINED SPACES.** |
| Blue band | Dry powder | All types of small fire. |

Fire blankets are also provided in laboratories and can be used to smother any fire.

When taking the decision to fight a fire, it is important that no personal risks are taken. Be sure you know how to use the fire extinguishers – read the instructions.

Fire safety training is mandatory for all. The online fire training course can be booked through the Safety Office. Fire training must be refreshed **annually**. For more details contact the Fire Safety Manager (FSM), Department Safety Officer (DSO) or Department Safety Manager (DSM).

All fire extinguishers **must** be recharged after use even if only partially discharged. If a fire extinguisher *is* discharged, this **must** be reported immediately after the incident.

Every extinguisher carries a label which gives information on who to contact so that the extinguisher can be replenished.

All fires should be reported to the Department Safety Officer and Fire Manager. Remember it is essential to replace all empty and partially full extinguishers with fully charged ones as soon as possible after use.

## *3.3 Illness or Injury*

If someone is taken ill or injured, call for a First Aider. Ensure that you give clear instructions to find the casualty. The First Aider will decide on appropriate treatment and further action if necessary. Following treatment, the accident should be reported.

The names of the First Aiders are displayed on notices throughout the Department, a full list can be found in section 2.2.4 and on the Departmental website. The Departmental defibrillator is in reception. First aiders are trained in its use, but it can be used by anybody as the instructions are clear.

1. **Never** risk your own safety.
2. **Never** move a casualty unless necessary; always bring the First Aider to the casualty.
3. If there is more than one person in the vicinity, one person should stay with the casualty whilst another goes for help.
4. Once the First Aider arrives, **do what they tell you**. Be prepared to answer questions and give assistance as requested. **Do not interfere with treatment**.

If someone is taken ill or injured outside normal working hours call the University Security Control Centre (31818).

## *3.4 Accident / Incident Reporting*

All accidents, incidents, work-related health conditions and near misses must be reported using the AssessNet reporting system - https://www.safety.admin.cam.ac.uk/subjects/accidents-and-incidents/report-accidentincident

Submission of a report via the portal will alert the DSO and DSM, who will instigate an investigation. You may be asked to assist with an investigation. Any information that could be used to help prevent recurrence will be gratefully received. All reports are fed back to the Health & Safety Committee at its regular meetings.

## *3.5 Other Out of Hours Incidents*

In all other cases call the University Security Control Centre (31818) who will contact the appropriate authorities. DO NOT expose yourself to unnecessary risk. If someone is severely injured immediately call for an ambulance (999).

# Section 2

# Health & Safety Policy for the Department of Plant Sciences

# 4 Health & Safety

This section, which supplements the University of Cambridge Safety Policy, Codes of Practice and associated Guidance available from the University Safety Office website, states the Departmental Policy on Health and Safety and outlines responsibilities and arrangements for ensuring your safety. Its aim is to help you work safely and avoid accidents by providing a framework within which a safe method of work can be established. It is therefore important that you read the advice given here before you start work in the Department.

Accident prevention is common sense, tidiness, and forethought, but safety within laboratories does require constant vigilance and care. Remember that a little planning and thought can save a great deal of trouble and regret. Always seek expert advice when in doubt.

You are required to sign and return the accompanying declaration stating that you have read this section and are satisfied as to yours and the Department's responsibilities with respect to safety.

Copies of all Departmental Safety Documents referred to in this document are available on the department's intranet and, when relevant, in the group's local safety information. If you have difficulty locating information, please ask your Group Safety Contact or contact the Departmental Safety Manager / Departmental Safety Officer.

This information will be reviewed at least annually, and supplementary information distributed to all members of the Department. Suggestions for inclusion, corrections and revisions should be sent to the DSM.

## *4.1 THE STATEMENT OF HEALTH AND SAFETY POLICY & ORGANISATION*

As Head of the Department of Plant Sciences, I am responsible for ensuring compliance with Health and Safety legislation. My responsibilities are set out in Section 4.2.1 of the Departmental Induction Handbook. However, I have delegated tasks and duties to others in the Department who have the authority to act on my behalf.

The Department is committed to safeguarding the health, safety and welfare of all staff, students and others who may be present in the Department, or affected by the Department's work, as far as is reasonably practicable. As such, it is the policy of the Department to provide and maintain safe and healthy working conditions, equipment, and systems of work for all its staff and students. To this end, information, training, and supervision is provided where necessary.

The Department recognises that full compliance with all aspects of legislation relating to health and safety is essential. Therefore, all relevant legal requirements must be met.
Health and safety management is a core function of the management structure of the Department. The Department also recognises that competent health and safety management necessitates the allocation of appropriate resources, both in terms of money and staff time.
All persons present within the Department have a legal responsibility to ensure the safety of themselves and of others who may be affected by their actions.

Therefore, **all persons** must exercise self-discipline, comply with all Departmental codes of practices and policies, look out for potential hazards, and seek to ensure that they are appropriately addressed.

The Induction Handbook states the safety management process within the Department including **all buildings under its operational control** and outlines the roles of those with executive and advisory responsibility for safety.

The Handbook will be reviewed on an annual basis to reflect any changes in Health and Safety legislation, working practices and procedures.

Professor Julian Hibberd
Head of Department

## *4.2 THE ORGANISATION FOR CARRYING OUT THE POLICY*

Ultimate responsibility for health and safety within the Department lies with the Head of Department. For routine health and safety matters, the line of responsibility follows managerial lines as indicated in Figure 1. However, every employee with a supervisory role carries executive responsibility and is responsible for ensuring, in accordance with the law, the health and safety of staff, students and other persons in their area of responsibility and anyone else who may be affected by their work activities. The responsibilities of Principal Investigators and Supervisors are detailed below.

### 4.2.1 Head of Department (HOD)

In discharging their responsibilities, the Head of Department is responsible for, either directly, or through delegated authority (which is detailed in writing):

1. Ensuring adherence in all respects to the Health and Safety Policy of the University of Cambridge and to ensure that the necessary resources for implementation are available.
2. Planning, organising, monitoring, and reviewing the arrangements for health and safety including the arrangements for any visitors (including contractors).
3. Ensuring that the duties relating to safety in the Department are understood.
4. Ensuring that training and instruction have been given in all relevant procedures including emergency procedures.
5. Ensuring that Departmental teaching and research are conducted in a safe fashion to avoid unnecessary hazards and to control risks to reduce the level of risk to acceptable levels.
6. Keeping fabric, equipment and services in a safe condition and ensuring that proper steps are taken to remedy defects.
7. Informing the University Health and Safety Division before any significant hazards are introduced or when significant hazards are identified.
8. Ensuring that regular safety inspections are undertaken.
9. Investigating and keeping records of all accidents and incidents and to report immediately to the University Health and Safety Division any serious or potentially serious accident or incident.

The Head of Department has appointed a Department Safety Officer (DSO), a Biological Safety Officer (BSO), a Radiation Protection Supervisor (RPS), a Laser Safety Officer (LSO) and a Departmental Safety Manager (DSM). The day-to-day implementation of Departmental Safety Policy is delegated to the DSO, BSO, RPS, LSO, DMS, Heads of Research Groups and their senior staff. Matters affecting safety must be given high priority and any delay must be reported to the DSO.

### 4.2.2 Departmental Safety Officer (DSO)

The Departmental Safety Officer is responsible for:

1. Advising on the measures needed to carry out the work of the Department with the minimum of risk to health and safety.
2. Liaising with the University Health and Safety Division and Enforcement Authorities on all matters of health and safety.

3. Coordinating any safety advice given in the Department by specialist advisers and the University Health and Safety Division and providing a point of reference on all health and safety matters.
4. Investigating and reporting on accidents causing injury and/or damage and recommending remedial action to prevent reoccurrence.
5. Monitoring health and safety within the Department and reporting any breaches of the Health and Safety Policy to the HOD.
6. Organising safety training for staff and students.
7. Presenting a written annual report to the HOD regarding all safety matters in the Department.
8. Providing regular reports to meetings of the Departmental Safety Committee.
9. Offering advice and assistance to the HoD (Head of Department) on matters relating to the safe use, handling and storage of hazardous substances within the Department.
10. Devising Departmental policy, local rules, and procedures on all aspects of chemical safety including chemical waste etc.
11. Assisting Principal Investigators and Supervisors in identifying training needs.
12. Ensuring that procedures for safe handling of hazardous substances are being adhered to and that hazardous substances are transported and stored appropriately.
13. Investigating any accident or incident involving chemicals.

### 4.2.3 Biological Safety Officer (BSO)

The Biological Safety Officer is responsible for:

1. Advising on the safe use of biologically hazardous materials within the Department.
2. Giving guidance on the preparation of appropriate COSHH and other risk assessments and assessing their veracity.
3. Establishing safe operating procedures for the use of biologically hazardous materials including genetically modified material and ensuring that local rules are in place and being followed.
4. Cooperating and liaising with the University Health and Safety Division, Occupational Health Service and outside specialists and inspectors on matters of biological health and safety.
5. Ensuring that the Department cooperates with the University in the implementation of policies to cover waste disposal and the safe transport and storage of biological materials.
6. Monitoring acquisition of any licences or authorisations which may be required for the work being carried out in the Department e.g. from the HSE (Health and Safety Executive), DEFRA (Department for Environment Food and Rural Affairs) (Department for Environment Food and Rural Affairs), EA etc, and to check that statutory notifications are in place.
7. The establishment, maintenance, and servicing of a Departmental Biological Safety Committee.
8. Arranging, undertaking, or assisting in the periodic inspections of Departmental premises where biological work is being undertaken.
9. The investigation of any biological emergency, incident or accident and enforcing any necessary remedial action.
10. Providing regular reports to meetings of the Departmental Safety Committee.

### 4.2.4 Radiation Protection Supervisors (RPS)

The Radiation Protection Supervisors are responsible for:

1. Ensuring that all work with radioactive sources complies with the requirements of the Ionising Radiations Regulations 1999 which are enforced by the Health and Safety Executive and the Radioactive Substances Act 1993 which is enforced by the Environment Agency.
2. Preparing, maintaining, and issuing the Department-wide local rules, and supervising their implementation.
3. Approving risk assessments for new work involving radionuclides.
4. Ensuring that adequate training in the use of radioactive sources is provided.
5. Authorising workers to use radioactive sources.
6. Authorising the acquisition of radioactive sources.
7. Supervising the Department's system for accounting for radioactive sources and their disposal
8. Ensuring that appropriate critical examinations are carried out and documented.
9. Supervising the system for testing of radiation monitoring instruments.
10. Carrying out annual audits of holdings of radioactive sources, including organising leak test.
11. Being able to offer practical advice and assistance to users of radionuclides.
12. Aiding in dealing with emergencies.
13. Responding as appropriate to specific incidents involving radioactive sources.

### 4.2.5 Laser Safety Officer (LSO)

The Laser Safety Officer is responsible for:

1. Providing advice and guidance on Laser Safety within the Department.
2. Consulting with the University Health and Safety Division whenever necessary.
3. Ensuring that risk assessments, local rules and procedures are in place and that safe working procedures are followed.
4. Reporting and investigating any accident or incident involving a laser, including ‘near misses.’
5. Maintaining any necessary registers of lasers and laser users.
6. Routinely inspecting laser installations.
7. Presenting an annual written report to the HOD regarding Laser Safety in the Department.

Providing regular reports to meetings of the Departmental Safety Committee

### 4.2.6 Departmental Safety Manager (DSM)

1. Assists the DSO in discharging their responsibilities and has delegated authority to do so. This includes all items listed under 4.2.2
2. Acts as Secretary to the BSC.

### 4.2.7 Principal Investigators and Supervisors

The responsibilities of Principal Investigators and Supervisors include:

1. Setting a good example to their staff and students at all times.
2. Ensuring that their specific research projects are well-managed so as not to cause illness or injury.

3. The production and reinforcement of a Research Group Management Plan which at the very minimum addresses safety where appropriate.
4. Ensuring that all new members of staff, students and visitors have suitable and sufficient training to perform their duties safely; to discuss their training with the Departmental Safety Manager; to provide them with a copy of local safety rules and to provide an appropriate level of supervision. The Principal Investigator should keep a checklist of matters to be discussed and this list should be revised (annually). Records of training must be kept including the Individual Safety Training Record.
5. Ensuring that all work in their group is conducted in line with Departmental policy and that appropriate control measures are used, and procedures followed by means of regular inspections.
6. Ensuring that their areas of responsibility are kept clean and tidy, that rubbish is not allowed to accumulate, and that circulation spaces, gangways and corridors are kept clear to maintain safe access.
7. Ensuring adequate liaison with internal and external organisations as required.
8. Ensuring that work under their supervision has been assessed **prior** to work commencing and that suitable and sufficient risk assessments have been completed; and that all researchers under their supervision are aware of the content and location of such risk assessments. Where necessary, it may be more appropriate for individual researchers to undertake the relevant risk assessments and where this is the case, Principal Investigators and Supervisors must ensure that their research workers have received the necessary information, instruction, and training to be competent to undertake the assessment.
9. Ensuring that members of their group have access to adequate information regarding the hazards and risks associated with their projects and that they are aware of the procedures to be followed in the event of an accident or emergency.
10. Assessing the degree of experience of each member of their group and if necessary, to provide or arrange for further training.
11. Appointing a Group ‘Safety Representative’ from those staff whose regular presence in the lab can be assured. The appointed person shall assist the Principal Investigator in performing their health and safety duties and responsibilities.
12. Ensuring that short-term workers or visitors to the group are closely supervised while working in the laboratory.
13. Ensuring that all group members understand the Department’s waste disposal policy and the correct routes for disposal of waste.
14. Ensuring that all graduate students attend the University and Departmental safety induction training courses.
15. Ensuring that health screening and health surveillance takes place when appropriate.
16. Ensuring that items within laboratories are stored correctly.
17. Ensuring that all necessary personal protection equipment and safety devices are available.

### 4.2.8 Group Safety Contacts

The responsibilities of Group Safety Contacts include:

1. Advising and assisting the Principal Investigator or Supervisor in training new personnel.
2. Disseminating safety information.

3. Conducting inspections of the group laboratories and inspecting and ensuring the maintenance of group equipment such as spill kits (where applicable), fire extinguishers, safety shower and eye wash facilities.
4. Safety issues involving laboratory hygiene.

### 4.2.9 Individuals

All employees, affiliated members, students and all other persons entering onto the premises or who are involved in university activities are responsible for exercising care in relation to themselves and others who may be affected by their actions or omissions. Those in immediate charge of visitors (including contractors) should ensure that the visitors adhere to the requirements of the Department's safety rules and procedures.

You must:

1. Make sure that your work is carried out in a safe manner and in accordance with University and Departmental Policy. If you feel you have insufficient training to complete a task safely, ask your supervisor for training to be arranged which must be recorded in your Individual Safety Training Record.
2. Obey all instructions, written or verbal, issued by those appointed with responsibility for health and safety.
3. Make it your responsibility to keep up to date with any changes in policies, practices, and procedures.
4. Inform yourself of the health and safety hazards of the equipment and materials with which you are concerned, as far as these hazards may be foreseen.
5. Protect yourself and others by wearing the personal protective equipment provided, and by using any guards or safety devices provided. It should be noted that it is illegal to intentionally or recklessly, interfere with or misuse anything provided in the interests of health, safety, or welfare, and this would include over-riding interlocks on equipment, removing guards and insulating equipment from electrical apparatus and removing earth wires.
6. Report all accidents, incidents, and near misses immediately to the DSM including deficiencies in safety equipment and procedures.
7. Bring to the attention of your supervisor any potential hazard to health and safety whether in your routine work or arising from faults in equipment.
8. Familiarise yourself with the location of firefighting equipment, alarm points, escape routes and assembly points, together with fire and emergency procedures.
9. Not attempt to work in the Department if you are under the influence of alcohol or drugs.

This statement is from the University's Little Green Book:

> Misuse of alcohol, drugs**,** and other substances such as solvents or barbiturates can affect work performance and safety. Strict standards are needed in jobs where safety is critical, and disciplinary action may be taken. Confidential advice and help may be obtained from the University's Counselling Service for Staff and Students or Occupational Health Services.

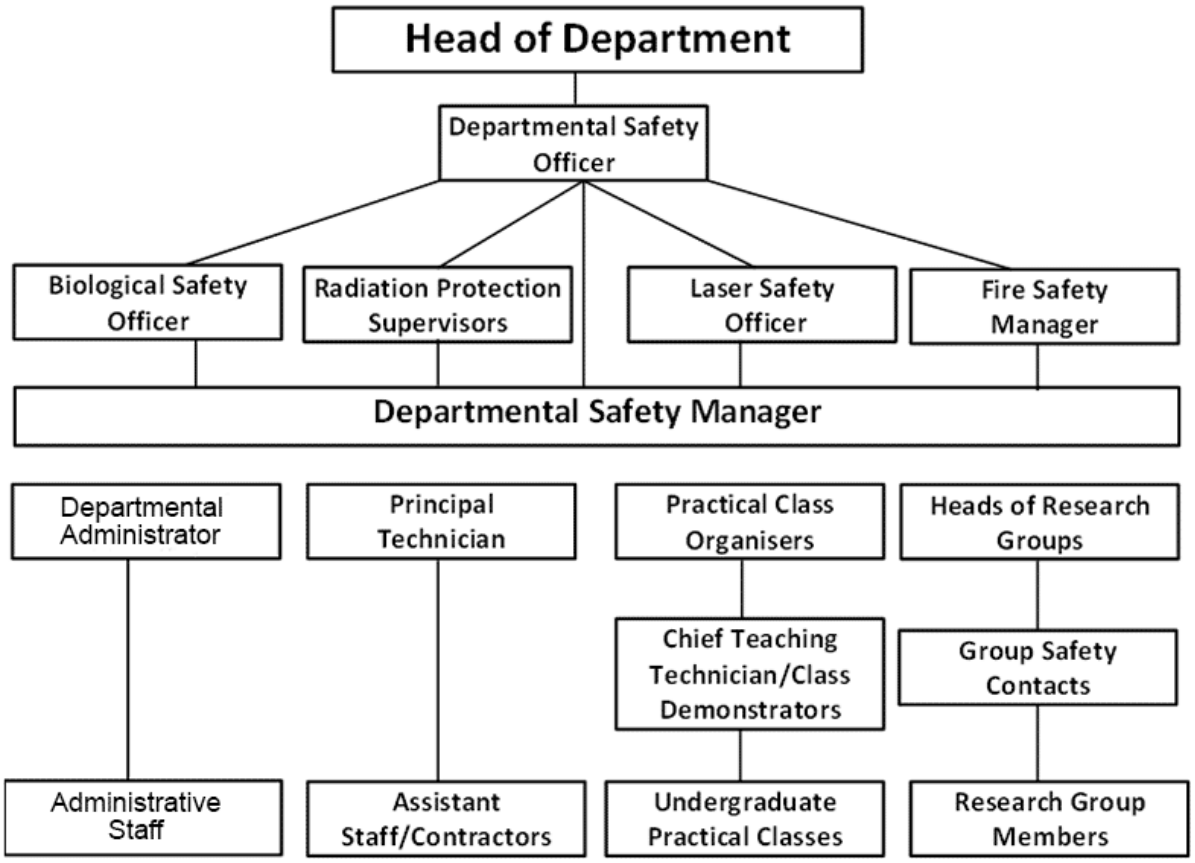



**Figure 1 Organisational Chart for Departmental Health & Safety**

### 4.2.10 Safety Committee

In addition to the above arrangements, the Department has established a Safety Committee. This Committee reports to the Staff Meeting and has an advisory and consultative function for the HOD. The Departmental Safety Committee is advised, as necessary, by the School of Biological Sciences Safety Officer, the University's Director of Health and Safety, the University Fire Officer, and the University Radiation Protection Officer.

The Safety Committee is concerned with all aspects of health and safety of staff and students within the Department. The Committee aims to develop and maintain high safety standards within the Department by promoting cooperation in instigating, developing, and carrying out measures to ensure the health and safety of **all** members of the Department.

The Safety Committee meets regularly (at least four times a year) and considers any relevant safety matter brought to its attention from inside or outside the Department.

The purpose of the Safety Committee is:

1. To develop a Health and Safety Strategy for the Department.
2. To monitor the day-to-day implementation of the Departmental Health and Safety Policy and to make recommendations regarding changes in safety policy or procedures as appropriate.
3. To monitor and review the practical implementation of new legislative requirements or changes in the Health and Safety Policy as recommended by the DSO or the University Health and Safety Division.

4. To consider reports from enforcing authorities, reports and other data from internal inspections, surveillance, and monitoring and to make recommendations to the HOD for consequent improvements to health and safety procedures.
5. To study accidents, incidents, and dangerous occurrences statistics to identify unsafe and unhealthy conditions and practices and to make recommendations for corrective actions to the HOD.
6. To monitor and review the effectiveness of health and safety training and to make appropriate recommendations.
7. To receive the Departmental Annual Report on health and safety.
8. To consider recommendations or complaints from staff or students and recommend appropriate action.
9. To deal with unresolved health and safety issues.
10. To monitor the adequacy of health and safety communication and publicity within the Department.
11. To exercise such powers as may from time to time be delegated to it.

**Constitution:**

The Safety Committee is made up of the following representatives.

Members of the Department:

- Head of Department (Chair)
- Department Administrator (Secretary)
- Safety Officer x 2 (Downing Site and Crop Science Centre)
- Safety Manager
- Biological Safety Officer
- Laser Safety Officer
- Radiation Protection Supervisors x 2
- Principal Technician
- Senior First Aider
- Facilities and Maintenance Manager
- Lab Manager (Crop Science Centre)
- Research Technician Representative
- Contract Research Staff Representative
- Postgraduate Student Representative
- Part II Student Representative

External:

- Safety Office
- School of Biological Sciences Safety Officer
- Occupational Health (not attending)

Further information can be found on the Safety Committee webpage.

### 4.2.11 Biological Safety Committee

In addition to the above arrangements, the Department has also established a Biological Safety Committee. This Committee reports to the Safety Committee and has an advisory and consultative function for the HOD. The Departmental Biological Safety Committee is advised, as necessary, by the Biological Sciences Safety Officer, the Chairman of the University's Biological Safety Sub-Committee and the University's Director of Health and Safety.

The Biological Safety Committee is concerned with the safe use of biological materials, including genetically modified materials, by staff and students within the Department. The Committee aims to develop and maintain high safety standards within the Department by promoting cooperation in instigating, developing, and carrying out measures to ensure the health and safety of **all** members of the Department.

The Biological Safety Committee meets regularly (at least four times a year) and considers any relevant biological and genetic modification safety matters brought to its attention from inside or outside the Department.

**Terms of Reference:**

The purposes of the Biological Safety Committee are:

1. To develop a strategy for the safe use, transport, and disposal of biological materials in the Department.
2. To ensure that adequate training is provided for individuals wishing to undertake work using biological materials and to monitor and review the effectiveness of that training.
3. In relation to use or creation of genetically modified material, to provide advice, to review risk assessments, to review safe operating procedures and to authorise work.
4. To maintain records of work that utilises or creates genetically modified material.
5. To ensure in relation to work which utilises or creates genetically modified material that statutory notifications are in place and that necessary licenses or authorisations have been obtained.
6. To consider relevant reports and data from enforcing authorities, internal inspections, surveillance, and monitoring and to make recommendations to the Safety Committee for consequent improvements to health and safety procedures.
7. To study accidents, incidents, and dangerous occurrences statistics to identify unsafe and unhealthy conditions and practices; and to make recommendations for corrective actions to the Safety Committee.
8. To monitor and review compliance with and to make appropriate recommendations.
9. To exercise such powers as may from time to time be delegated to it.

**Constitution:**

The Biological Safety Committee is made up of the following representatives.

Members of the Department:

- Biological Safety Officer (Chair)
- Departmental Safety Manager (Secretary)
- Departmental Safety Officer
- Research Technician Representative
- Contract Research Staff Representative
- Postgraduate Student Representative

External:

- School of Biological Sciences
- Occupational Health (not attending)

Further information can be found on the Biological Safety Committee webpage.

**Occupational Area of the Policy**

The policies and procedures described in this manual apply to all buildings under the operational control of the Department of Plant Sciences. Members of the Department undertaking work in other departments must abide by their local rules. This includes the Botanic Garden and The Sainsbury Laboratory.

## *4.3 Golden Rules*

1. **You must read and abide by all the information given in this document**.
2. **You must obey all safety signs and warnings.** Maximum loading and restricted area notices, danger, no entry, illuminated signs and alarms are installed only after careful consideration and for your safety. Their message must not be ignored.
3. **You must not use any equipment or apparatus for the first time without proper instruction in its use.**
4. **Do not attempt to repair or modify any apparatus unless you are competent to do so**. Faulty or damaged equipment must not be used.
5. **Smoking/vaping is forbidden within the Department.**
6. **Eating and drinking is only permitted in the Tea Room and in offices which are <u>not</u> accessed through a laboratory.** The Department has no facilities for food preparation. A fridge is provided for the daily storage of pre-prepared food; it must not be used for long term storage and users must agree to be on the cleaning rota. Two microwaves (which should not be left unattended while in use) are available for reheating pre-prepared food. All spillages must be cleaned up immediately.
7. **Personal audio equipment and phones must not be used while carrying out hazardous procedures or while moving round the Department**. The use of personal audio equipment must be risk assessed. Users must be able to hear if someone speaks to them or if an alarm sounds.
8. **Keep your work area tidy and in a safe condition.** You must ensure at the end of each day that the area is safe and secure. At the end of an experiment or project, you are responsible for ensuring that everything is cleared away and that unidentified substances are not left behind to create a potential hazard or disposal problem for others.
9. **Doors marked 'FIRE DOOR – KEEP SHUT' must not be wedged or otherwise fastened in the open position.** If they fail to close of their own accord, this must be reported to the Fire Officer.
10. **Corridors and staircases must not be used as working or storage areas.** They must provide safe circulation and routes of escape in an emergency. They must not be used as improvised cloakrooms.
11. **Firefighting equipment must be kept free of obstruction and readily available.** It is an offence to use it in any circumstances other than a fire.
12. **Running, throwing and disruptive behaviour are forbidden.** Even in an emergency, it is usually safer to walk quickly than to run.

## *4.4 THE ARRANGEMENTS OF THE POLICY*

### 4.4.1 Monitoring the Health and Safety Policy

Day to day monitoring of the Department's Safety Policy and arrangements is the responsibility of Heads of Groups.

Monitoring of the effectiveness of the Policy will also be carried out by way of planned Departmental inspections or 'Safety Tours.' All areas will be inspected at least once a year. The inspection team will consist of members of the Departmental Safety Committee and/or Biological Safety Committee, external safety advisers (and Trade Union Representatives). The HOD will also attend some inspections.

A formal report of each inspection will be made by the inspection team and will be written in a way that identifies remedial actions to be taken by named individuals. The report will be sent to the Departmental Safety Committee and HOD and to all Heads of Groups whose areas were included in the inspection.

A formal follow-up report of progress made on the recommended actions detailed in each inspection will be requested from the relevant Heads of Groups. These must be submitted to the Chair of the Departmental Safety Committee within 3 months of the inspection having taken place.

Impromptu and unannounced inspections will also be undertaken by the DSO/DSM and BSO in addition to the Safety Tours.

### 4.4.2 Sanctions

Contravention of the Department's Health and Safety Policy and procedures is not acceptable and appropriate action will be taken to ensure that the correct procedures are being complied with.

Minor breaches of the procedures will normally come to the attention of, and be dealt with directly by, the Supervisor of the person concerned. The Supervisor may consult with the DSM/DSO and may consider it necessary to issue a written formal warning. A further breach of the procedures would be considered to constitute a 'Major' offence.

Alleged major breaches of the safety procedures will be reported to the HOD, by the DSO, the supervisor, or the DSM. The HOD will investigate the matter and, if appropriate, issue one or more sanctions against the worker concerned.

Sanctions for a Research Worker may include suspension from using research apparatus in the Department until he or she has sufficient training and experience to recommence safe working. Persistent and/or flagrant abuse of the procedures may lead to permanent exclusion from the Department following formal processes conducted by the Board of Graduate Studies (for research students) or the University's disciplinary procedures (for employees). It must be remembered that individuals can be, and sometimes are, prosecuted by the Health and Safety Executive for breaches of statutory regulations and for carrying out dangerous operations or for permitting dangerous operations to be carried out.

All members of the Department are encouraged to keep a look out for activities that may be unsafe. Wherever possible, they should immediately report an unsafe situation to the Supervisor, the DSM, the DSO or (at night) the Night Security staff or Security Control Centre staff, who will assess the hazard and take appropriate action. Such action may involve immediate shut down of the activity without warning.

### 4.4.3 General Office Safety

For routine office activities there may be no significant health or safety risk and no further assessment of the work may be necessary. Non-routine office activities should be assessed, and where any significant hazards are identified, the results of the assessment should be recorded.

Falls are the most prolific cause of injury in offices. Other causes include: the handling and lifting of goods, materials and equipment; falling objects and stepping on or striking against objects. The maintenance of high standards of housekeeping is essential in offices. Care should be given to the layout and storage of items to minimise hazards. Particular attention should be given to:

- The condition of floors and floor coverings.
- Trailing leads and cables.
- Storage of items on shelves above shoulder height.
- Safe methods of reaching items stored on high shelves.
- Use of computers and display screen equipment.

### 4.4.4 Display Screen Equipment

Sustained use of display screen equipment including computers carries a risk of injury to the upper limbs and back due to poor workstation layout and work practices. Reference should be made to the quick guides for setting up desktop and portable workstations, as well as the more detailed document titled Display Screen Equipment (DSE) (rev2). Further information is available on the Safety Office webpages and the Occupational Health webpages or in your group's local safety information. All DSE users must complete a work assessment. If you are having visual difficulties, contact Occupational Health for an eye screening test.

### 4.4.5 Pregnancy

There are risks which may affect the health and safety of new and expectant mothers and of their child. Working conditions normally considered acceptable may no longer be so during pregnancy and while breastfeeding.

Expectant mothers are strongly encouraged to inform their supervisor that they are pregnant as soon as possible so that specific risk assessments can be done and put in place. They should also inform department HR (Katrina Wilson - Plant Sciences/Edelmira Bell - CSC) as soon as possible so that appropriate arrangements can be made.

They will need to complete the 'Expectant or New Mothers Risk Assessment', with input from their supervisor/line manager and then forward it to the Safety Manager for additional input if necessary. The risk assessment should be reviewed as time progresses as changes may need to be made due to pregnancy-related matters or due to practical issues such as ergonomics.

If required, Occupational Health (OH) will carry out a confidential health assessment and/or visit the work environment to advise and alleviate work-related risks or any concerns the employee may have. The risk assessment for breastfeeding mothers returning to work should be completed before or, if not practical, as soon as possible upon their return.

If you have any concerns about any aspect of your health and wellbeing, whilst preparing for or during pregnancy you can talk, in confidence, to Catherine Butler (Departmental Administrator) and Martyn Balmont (Safety Manager) at any time.

Further advice and information about the University's policy can be found here:

OH Guidance Expectant and new mothers

University Parental leave policy and procedure

### 4.4.6 Health and Safety Training

Training is an essential part of maintaining a healthy and safe environment. Training and instruction in routine matters must be given, as required, by supervisors or managers. The immediate supervisor or manager will inform new members of staff and students on their first day of joining about:

1. Action in the event of a fire.
2. Action in the event of an accident.
3. Their responsibility for following Departmental procedures including responsibility for reporting health and safety problems and how this should be done, and for cooperating with colleagues.
4. Any specific responsibilities they have in relation to health and safety.

Training must also be given on all pieces of apparatus and equipment, and additional training will be needed where individuals are expected to carry out risk assessments. Where training is given training records must be kept which detail date training received, name of trainer and signature of trainee.

### 4.4.7 General Electrical Safety

Approximately 50 deaths every year in the UK result from electrical shock. The other major risk associated with electrical installations and equipment is that of fire. It is therefore essential that all connections are made soundly; that the correct size cable is used, and that all installations and equipment have the correct fuse rating. If in doubt about connections to electrical services or apparatus, consult the Facilities Manager.

**Portable Electrical Appliances**

A portable electrical appliance is an item of electrical equipment which is connected to the mains electricity supply through a plug and socket system.

Any such appliance which is brought into the Department **must** be Portable Appliance Tested (also known as PAT-testing) before use including personal radios, kettles, fans, heaters etc.

There should be an official ‘Tested for Electrical Safety’ sticker on **all** portable electrical equipment. This will show a test date. If the re-test date (i.e. 12 months from the test date) has passed and your equipment has not been re-tested, then contact the Head of Group. To get something PAT tested ask facilities@plantsci.cam.ac.uk

**DO NOT USE ANY ITEM OF ELECTRICAL EQUIPMENT WHICH DOES NOT HAVE A CURRENT PAT STICKER OR WHICH HAS A RED ‘DO NOT USE’ STICKER**

### 4.4.8 Manual Handling

All manual handling tasks that have the potential to cause injury should be risk assessed. This may involve items that are heavy, liable to move around when carried, hot or cold, or may involve repetitive motions, or movement through restricted or open spaces. **Never**

move an item if you feel that it is too heavy or difficult to move. If you suspect that an item is too risky to move safely on your own, either get help or leave it alone. Sack trolleys are available for use when transporting heavy loads.

For further information on manual handling and manual handling risk assessments see the Safety Office's webpage on Manual Handling. Further information can be found in your group's local safety information or by contacting the DSO/DSM.

### 4.4.9 Risk Management

All work undertaken in the Department must be carried out safely. Before any procedure is used a risk assessment must be done to ascertain the hazards, the safest working practice, and the disposal routes necessary for all waste produced.

Generic risk assessments and COSHH risk assessments can be carried out by any competent person, however, supervisors should be reviewing all risk assessments, as they are responsible for all work carried out by their group. Risk assessments involving the use and/or generation of genetically modified microorganisms (GMOs) must be written by the Head of Group and submitted to the Biological Safety Committee for approval BEFORE the work can commence.

Risk assessments should be reviewed at least annually or sooner in the event of a change of procedure or accident/incident/near-miss, with a record of the review process kept.

Risk assessments, SOPs (Standard Operating Procedures) and relevant guidance must be read by all persons involved with the procedure. Everyone in the department is responsible for managing the risks involved with their own work to ensure the safety of themselves and others. Laboratorystaff must be aware of non-laboratory staff, visitors, cleaners etc. and consider them in all Risk Assessments.

The Individual Safety Training Record (yellow card) must be filled in and updated as necessary to record the training you have received and to help identify training needs. Guidance on Risk Management and Assessment is provided in the document Risk Management available online or in your group's local safety information. Further information on Risk Management can be found on the Safety Office's Risk Management webpages.

## *4.5 Laboratory Safety*

### 4.5.1 Biological Safety

It is the responsibility of the research group involved to check the safety of all biological experiments they are involved in and to register the appropriate risk assessment and GMO forms with the Biological Safety Committee.

**SPECIFIED AREAS ARE APPROVED FOR CONTAINMENT LEVEL 1 ACTIVITIES**

Anyone involved in experiments using biological materials must consult with their Head of Group and ensure where necessary that the work is registered with the Biological Safety Committee. Similarly, anyone performing genetic modification must check that they are working within the allowed guidelines.

There are strict guidelines for the disposal of biological material. Please ensure that you are aware of these rules.

Before starting work involving GMOs or other biological agents you must read Biological

Safety Committee: Code of Practice for working with GMOs which includes Biological Safety.

All accidents involving biological material must be reported to the BSO and the DSO.

**Bees**

Bumble bees are in room 103. If you are allergic to bee stings, please contact the Chief First Aider.

### 4.5.2 Chemical Safety

All members of the department must be aware of chemical safety throughout the building; everyone will encounter chemicals at some time. Non laboratory staff must be aware that there are hazards and enter laboratories only when they have permission and suitable guidance. Laboratory workers must read the document Chemical Safety before work begins and consider the safety of non-laboratory staff.

**Mercury thermometers are not permitted in the department. Any mercury thermometers that are found must be disposed of via the hazardous waste route immediately.**

All containers of chemicals must be clearly labelled with accurate information as to the contents and where possible, with the appropriate hazard warning symbol (pre- and post-2010 format), e.g.:

Flammable | Health Hazard | Corrosive | Acute Toxicity

### 4.5.3 Ionising and Non-Ionising Radiation Safety

**Ionising Radiation**

**Do not** commence any work with ionising radiation or radioactive material until you have been authorized by a Radiation Protection Supervisor (RPS), who can assist with appropriate training and making the necessary arrangements for registration with the University Radiation Protection Service.

All work carried out must comply with the requirements of the Radiation Regulations 1999 (IR 1999). Procedures must be Risk Assessed (RA) and recorded, on the University approved form prior to purchasing radioactive substances. Assessments must be reviewed if practices change.

The RA will demonstrate that exposure is kept As Low As Reasonably Practicable (ALARP) and that Best Available Technologies (BAT) are employed to minimise waste production and to minimise radiation exposures of the public.

Orders for radioactive materials must be approved by an RPS or designated deputy; collections from stores must be prompt and a signature is required from the collector.

All work must be performed in compliance with the Local rules for the safe use and disposal of radioisotopes, available online or in your group's local safety information.

All accidents involving radiation or radioactive material must be reported to the relevant Radiation Protection Supervisor and the DSO.

### 4.5.1 Lasers (including Confocal Microscopes)

All lasers within the Department must be sited and operated in accordance with current statutory, University and Departmental rules. The Laser Safety Officer (LSO) keeps a register of all lasers, their local rules and laser users. Anyone wishing to use a laser system must refer to local rules and undergo suitable training (normally arranged by the Research Supervisor) and be aware of the hazards involved.

Risk assessments for all experimental setups involving lasers must be updated on an annual basis. If a setup is used that is significantly different from existing ones, a new risk assessment must be carried out in consultation with the Research Supervisor and the LSO.

Only authorised users may use the confocal microscope facility. Authorisation requires suitable training in laser safety and notification of this to the LSO. The LSO keeps a register of authorised users. A written record is kept of confocal microscope usage.

Note: Eye examinations are not necessary for users of confocal microscopes or Class 1 laser systems. However, these are necessary for users of other Class 3B and Class 4 laser systems with unprotected beams, and users should consult the LSO to arrange this.

Anyone wishing to install equipment containing Class 3B or Class 4 laser systems should consult the LSO in the planning stage for the new laser installation (even if the beam is fully embedded and the equipment is classified as Class 1). Do not start using a new system without the consent of the LSO. Similarly, if a Class 3B or Class 4 laser system has been out of commission, you must consult the LSO before bringing it into use again. The LSO must also be notified in advance of repairs to Class 3B and Class 4 lasers. The LSO must be informed of all modifications to existing Class 3B and Class 4 laser systems that affect operation or application of the equipment changes, or to any changes in location or responsibility for the equipment.

For details regarding the safe use of lasers, and for contingency plans in case of accident, refer to the University Safety Office document titled Safe Use of Lasers. The LSO has copies of this safety manual and is there to help with all questions regarding laser use and safety.

All incidents and accidents involving lasers **must** be reported to the LSO and/or the DSO who will report it to the Health and Safety Division. **Do not** use the equipment until an investigation has been carried out to establish the cause of the incident/accident. If there is a suspected injury to the eye, consult Occupational Health, who will make an assessment and arrange any necessary referrals. If an injury is confirmed, the injured person should see a specialist ophthalmologist preferably within 24 hours of the accident. **Do not** drive.

If the accident occurs outside the normal working hours of Occupational Health, the injured person should attend the Accident and Emergency Department of Addenbrooke's Hospital, where a specialist ophthalmologist should be available for consultation. Take details of the laser beam with you to A&E; namely its wavelength (as this determines which part of the eye has most likely suffered damage), power/energy per pulse and pulse duration.

**Other Non-Ionising Radiation**

Ultraviolet (UV) sources are used in a variety of equipment and can be hazardous to the eye and skin. The risks to health from artificial sources of UV can be much higher than from naturally occurring UV. Typical levels of UV may be many times higher than that of the sun and include harmful wavelengths that are normally filtered by the atmosphere. Consequently, precautions should be taken to shield the source of radiation. It is vital to have in place control measures to limit exposure to the eyes and skin and to prevent cumulative exposure. The precautions needed will depend upon the risk assessment. Users must be aware of the possible consequences of exposure and the protective measures which need to be followed

to avoid exposure.

UV light boxes ('transilluminators') are commonly used in molecular biology laboratories for a number of purposes including the visualisation of ethidium bromide-stained nucleic acids separated on electrophoresis gels. These devices typically have peak outputs at 254 or 312 nm, well within the UV-C and UV-B regions that are biologically active and capable of damaging skin. The UV light emitted from transilluminators has been clearly identified as a potentially significant occupational hazard for many laboratory workers.

### 4.5.4 Gas and Pressure Systems Safety

**Compressed Gas Cylinders and Pressure Systems**

Gas cylinders and pressure systems can be dangerous if not handled and used properly. Do not attempt to handle them until you have received specific training to do so. Any person planning to use gas cylinders must complete the *'Using Compressed Cylinder Gases Safety in Universities'* online course provided by the University Safety Office. Access to the course can be found here: https://www.training.cam.ac.uk/ohss/search

There are two types of pressure system within the Department:

- Statutory vessels, which exceed 250 bar litres in capacity, such as compressors, autoclaves, pressure cookers, pressurised dewars and boilers.
- Research equipment, having pressures of 1 bar and above, such as purpose made cells.

Written Schemes of Examination are required for all statutory vessels. The University employs British Engineering Services (BES) to conduct formal inspections of all pressure vessels covered by statutory requirements. It is vital to note that only statutory pressure vessels with a valid pressure inspection certificate are covered by the University's insurers. Any vessel with an expired certificate MUST NOT BE USED until a new certificate has been issued. The department co-ordinates with BES to ensure all statutory vessels are inspected in good time to remain functional and compliant but any issues will be communicated to those affected.

Any item of pressure equipment purchased for use should come with a test certificate and this will be required for evaluation by the University Insurers. Speak to the DSO/DSM when you purchase any new pressure equipment to enable us to add it to the BES register if necessary.

Where the unintentional release of compressed gas has the potential to accumulate in sufficiently high concentrations to pose a risk to human health, the use of gas monitoring devices must be assessed and installed where required. Speak to the DSO/DSM for advice.

**Cryogenic Gases**

Normal ambient air contains an oxygen concentration of approximately 21% by volume, the other main constituents being nitrogen (~78%) and argon (~1%). Atmospheres containing less than 19% oxygen are considered oxygen deficient and are not considered safe to breathe. At concentrations of 12–14% oxygen, the respiration rate increases and judgement is impaired whilst atmospheres containing less than 11% oxygen can result in fainting, subsequent brain damage and death.

Small volumes of liquefied gas, e.g. liquid nitrogen, will evaporate into large volumes of gas (nominally a 700:1 expansion ratio) and can consequently deplete the oxygen content of air available to breathe resulting in asphyxiation. Hence, great care must be taken in the use of liquid nitrogen and other low-temperature liquefied gases, including asphyxiant gases such as nitrogen, helium and argon, which displace oxygen from the air.

When working with asphyxiant and cryogenic gases the following rules should be observed:

Never work with asphyxiant gases in poorly ventilated areas. Ensure that vessels (dewars) containing cryogens are only operated in an area that has adequate ventilation.

Do not accompany cryogenic vessels in lifts. Open dewars must not be transported in lifts.

Cryogenic equipment must have adequate pressure releases, safety valves and vent lines maintained to prevent the build up of pressure and possible explosion. Do not allow them to become heavily iced over.

Cryogenic liquefied gases can cause severe cold burns if allowed to come into contact with the skin or other delicate tissues such as eyes. Protective clothing (leather gloves or equivalent and eye protection) must be worn where there is a risk of splashing cryogenic liquid onto the skin or eyes and at all times when decanting liquid from a dewar.

In spaces where the risk of Oxygen depletion to a dangerous level has been identified, oxygen concentration monitoring equipment will be installed. These systems contain an audible alarm system that will sound when the concentration drops below a set threshold (usually below 19%). If the alarm sounds, you must evacuate the area and not return until the concentration has returned to above 20%.

**REMEMBER: NITROGEN, HELIUM AND ARGON CANNOT BE DETECTED BY SIGHT OR SMELL AND THERE MAY BE NO WARNING THAT DANGEROUS LEVELS ARE BUILDING UP.**

**NEVER GET IN THE LIFT WITH LIQUID NITROGEN**

**ASPHYXIATION FROM THE LACK OF OXYGEN CAUSES SWIFT PAINLESS DEATH WITHOUT PRIOR WARNING OF DANGER.**

**DO NOT USE/STORE IN SMALL UNVENTILATED AREAS**

### 4.5.5 Electrical Safety

In addition to the general electrical safety guidelines outlined in section 4.4.7 General Electrical Safety, the following notes additionally apply to laboratory environments.

**Electrical Safety User Checks**

Another aspect of electrical safety is the user check which should be done by **you**. The user is normally the person most familiar with the equipment and may be in the best position to know if it is in a safe condition and working properly.

The user should:

- Disconnect the equipment from the supply; either by unplugging or by an isolating switch.
- Inspect the equipment:
    - **The flex** - Is it in good condition? Is it free from cuts, fraying and damage? Is it in a location where it could be damaged? Is it too long, too short or in any

other way unsatisfactory? Does it have inadequate joints?
    - **The plug (where fitted)** - Is the flexible cable secure in its anchorage? Is it free from any sign of overheating? Is it free from cracks or damage?
    - **The socket outlet or flex outlet** - Is there any sign of overheating? Is it free from cracks, contamination damage to the case, or damage which could result in access to live parts? Can it be used safely?
    - **The appliance** - Does it work? Does it switch on and off properly?
    - **The environment** - Is the equipment suitable for its environment? If equipment is likely to have water splashed onto it, is it protected to the appropriate standard? Where solvents are used, is the equipment spark-free?
    - **Suitability for the job** - Is the equipment suitable for the work it is required to carry out e.g. if equipment is used continuously is it designed for this? Is the equipment being used to drive an appropriate load? Overhead stirrers can become overheated when impeller blades which are too large or too long for the capacity of the motor are used. Always use the type of blade for which the stirrer has been designed.
- Act on faults/damage.

Faulty equipment must be:

- Switched off and unplugged from the supply.
- Labelled to identify that it must not be used.
- Reported to a member of facilities@plantsci.cam.ac.uk (33929)

Frequency of checks:

- The user should check handheld equipment, e.g. power drills and soldering irons, before use.
- The user does not need to regularly check computers that are used in offices only. Other items should be checked weekly.

**Reducing the Risks of Electrical Shock**

When working with experimental equipment, the risk of electrical shock can be reduced by adopting the following general practices:

- Earth all metal work.
- Do not handle the equipment with wet hands. Do not work in close proximity to water supplies.
- Switch off when making alterations or modifying circuits.

**Electricity Supply Services**

The supply services to laboratories must not be interfered with or altered in any way by unauthorised persons. The responsibility for these supplies lies with the Principal Technician.

**Long Flexible Leads**

The practice of trailing electrical leads, very often carrying mains supply voltage, across the floor is especially undesirable where people are likely to walk. This results in wear to the cables and presents a trip hazard. Rubber cover strips should be used, or else the cables should be taken overhead on a gantry.

**Use of Batteries**

Caution should be exercised when working with low voltage supplies. Fatal accidents have occurred with only a 40 V supply. High-tension batteries have an innocent appearance but are capable of inflicting lethal electric shocks. Banks of high-tension batteries connected in series can be extremely dangerous and should not be used for low voltage supplies. The

terminals and connections should be protected to avoid the danger of short circuit, and hence burns, arising from conductors which may accidentally fall on to the battery.

**Safeguards against Electrical Shock**

With correctly earthed supply installations and well-designed and correctly earthed commercial equipment, the risk of electrical shock should be zero. Be aware of high voltage supplies over 10 kV which can be a hazard to someone being close to, but not actually touching, the apparatus.

To guard against hazards the initial connections to large instruments should normally be made by the Maintenance Section or the installation engineer.

The continuity of earth connections on portable equipment must be checked periodically and if any equipment is unearthed, a notice must be attached which makes this quite evident to any unsuspecting person.

**Safeguards against Electrical Fires**

The risk of fire from failure of electrical apparatus is normally slight and the principal safeguard is to ensure that the equipment is correctly fused so that it will be isolated from the live main as soon as the current has reached an excessive value. Note that there is a range of fuse ratings for use in standard fused three-pin plug-tops and the appropriate current rating for the equipment concerned should always be used.

Care should be taken that fuses which have blown on equipment or apparatus are replaced by ones of correct rating. Where those in fused switch boxes have blown, the fault must be traced before reconnecting the equipment to the supply.

Ovens, electric fires, soldering irons, etc., should be switched off when not in use. Heat guns **must** be switched off and disconnected from the mains (i.e. unplugged) when not in use.

Solvents must only be stored in Fridges/Freezers designed for that purpose.

Master switches associated with experimental equipment for use in emergencies should be clearly marked.

The use of multi-socket adaptors and international adaptors is **NOT** permitted. Please consult the Facilities Manager when wishing to use extensions/multi-gang extensions.

### 4.5.6 Personal Protective Equipment

The term Personal Protective Equipment (or PPE) refers collectively to equipment such as safety glasses, goggles, aprons, lab coats, protective shoes, respiratory protective equipment, ear defenders and similar equipment used to protect the person during their work. PPE is the last resort and only protects the wearer from harm. Alternative methods for controlling the hazards must have been considered. PPE is the protective measure which is most likely to fail because of it being damaged, poorly maintained, misplaced, forgotten, misused or because of it being an inappropriate or ineffective choice in the first place. The use of PPE (unless mandatory) will be specified by the risk assessment for the activity.

**Eye Protection**

The eyes are very easily damaged, and injury to them is probably more serious than to any other organ. It is important to risk assess the need for eye protection and to use the appropriate type. See Personal Protective Equipment available online or in your group's local safety information. Eye/face protection is compulsory when stated in a risk assessment.

**Gloves**

Appropriate gloves should be worn when handling substances that may be absorbed through the skin or that are corrosive, harmful, irritant or otherwise damaging to the skin; appropriate gloves are identified by risk assessment. Users should be aware of the limitations of their gloves. Safety data and information should be supplied with any gloves purchased such as chemical resistance, break through time etc. If in doubt as to the suitability of any gloves you have or require, help and advice can be sought from the DSO/DSM or manufacturer.

Latex allergy is widespread. Powdered latex gloves MUST NOT be purchased or used in any University department. Non-powdered latex gloves may be used if you have no pre-existing allergy and where lower-allergy alternatives (e.g. nitrile) are not deemed suitable for use by risk assessment. If you have been diagnosed with a latex allergy, you must notify your fellow lab workers to ensure that latex gloves are not worn when handling communal equipment.

Gloves should be inspected for tears or punctures prior to use and should be removed when they become contaminated or damaged, or immediately after finishing the task at hand. Gloves **must not** be worn when using the phone, opening doors or fridges. Gloves **must not** be worn outside the laboratory except to transfer a sample from one room to another provided that an un-gloved hand is used to open the door or operate keypads etc. Hazardous materials must be correctly contained while transporting round the department i.e. the outside of the container must be safe to handle; the contents must not be able to fall out if the container is dropped.

Gloves, such as Marigold rubber gloves, worn to protect the hands must be washed prior to removal.

**Masks and Respirators**

Respiratory protective equipment (RPE) e.g. masks and respirators, lies at the bottom of the hierarchy of control measures because it protects only the person wearing it. However, there are occasions on which it is required as an additional protection measure, or when an operation takes place so infrequently that the installation of engineering control measures is not reasonably practicable. The University Herbarium is the only area to have RPE. See Personal Protective Equipment available online or in your group's local safety information.

**Footwear**

Footwear that covers the feet and offers protection against spillages and falling objects should always be worn in the laboratory.

Protective shoes that conform to British Standards should be worn when handling gas cylinders or other heavy equipment.

**Laboratory Coats**

Clean, fastened Howie style lab coats **must** be worn in all laboratories. They should be professionally laundered regularly and whenever they become contaminated. Permanently contaminated lab coats must be disposed of via the correct waste route. Lab coats **must not** be worn outside the work area, in the Tea Room, toilets, libraries and offices and **must not** under any circumstances be taken home to wash. Lab coats must be replaced when worn or exhibiting signs of significant deterioration (i.e. holes). There is a system in place within the Department for the laundering of all lab coats. Contact Stores for further information.

**Glassware and Sharps**

The most common accidents resulting in injury within the Department occur because of handling sharp objects or glass. The use of sharps must be considered in the risk assessment for a procedure. It is also strongly recommended that any person working with glass or sharps also complete the online '*Glass and Sharps Hazard Training'*

course.

**Never** use or store defective glassware. Always discard broken glass into a ‘Broken Glass’ bin.

**Never** put broken glass into a normal bin.

**Never** leave needles or scalpel blades lying around. Needles and blades should be guarded / protected when not in use. Sharps (i.e. syringe, needles plus bodies, razor blades and scalpels) should always be disposed of in the yellow sharps bins.

**Rubber and Plastic Tubing**

When setting up apparatus, tubing-to-glass joints should always be secured. Rubber and plastic tubing should be periodically checked and any that is perished or cracked must be replaced. Floods are all too frequent occurrences and can cause considerable damage. Take care when removing rubber tubing from glass; stuck tubing should be cut off.

**Transport of materials**

The Department operates at more than one site. All experimental materials transferred between these sites must be transported in the Departmental van according to the available guidelines; nothing must be carried by hand. For further guidance see the Growth Facilities: Services and User Responsibilities and Departmental procedures for transport of biological materials available online or in your group’s local safety information.

### 4.5.7 Waste Management

It is essential that all waste produced is disposed of via the correct route. The document Waste Disposal Policy available online or in your group’s local safety information gives clear instructions for disposal. Before a procedure begins, the risk assessment will determine the route for disposal. DO NOT begin work until the disposal route has been ascertained. A poster is displayed in all laboratories.

## 5 Waste disposal policy and procedures

UNIVERSITY OF CAMBRIDGE
Department of Plant Sciences

# WASTE DISPOSAL

# POLICY AND PROCEDURES

## The Department's Policy

As part of our waste policy Plant Sciences aims to:

- Dispose of all waste via the safest most appropriate routes.
- Maximise the amount of waste that is recycled and minimise the quantity of non-recyclable refuse.
- Recycle cans, paper, batteries, print cartridges, cardboard and furniture etc.
- Recycle or safely dispose of computers and electrical appliances.
- Add to the recyclables list as facilities become available.
- Purchase recycled resources wherever possible.
- Provide waste disposal guidance for all members of the Department, students and visitors.

***UNIVERSITY STATEMENT.***

## ***Individuals are responsible for:***

• Planning work carefully so as to minimise raw material consumption and waste production

• Reusing materials wherever practicable

• Recovering and recycling materials wherever practicable

• Ensuring that ALL unwanted chemicals, samples, accumulations of materials etc, including those in cupboards, fridges and freezers, are disposed of correctly at the end of their studies or employment with the University

• Identifying the intrinsic hazards of the waste produced and either to render the waste safe prior to disposal by pre-treating the waste or where this is not practicable, identify the appropriate waste disposal route and dispose of waste accordingly

• Segregating, containing and appropriately labelling waste in order to avoid problems of mixing incompatible wastes and to avoid spreading hazards in the work area

• Bringing to the attention of the Departmental Safety Officer or other nominated person(s) any non-conformance in relation to this policy / departmental waste management procedures

# Why is careful waste disposal so important?

Moral obligations:

- Cleaners. We use contract cleaners
- Visitors
- Non-laboratory staff
- Environment

Legal obligations:

- Duty of Care
- Trade effluent regulations (Environment)

The Environmental Protection Act 1990 introduced a Duty of Care

## The duty of care applies to everyone.

## Summary:

You must take all reasonable steps to keep waste safe. If you give waste to someone else, you must be sure they are authorised to take it and can transport, recycle or dispose of it safely.

## We provide you with guidelines:

You must know how to dispose of substances and by products before you start work *i.e.* as part of the Risk Assessment.

The substance you are using might be hazardous to you but that doesn't mean it's "hazardous waste"
So..

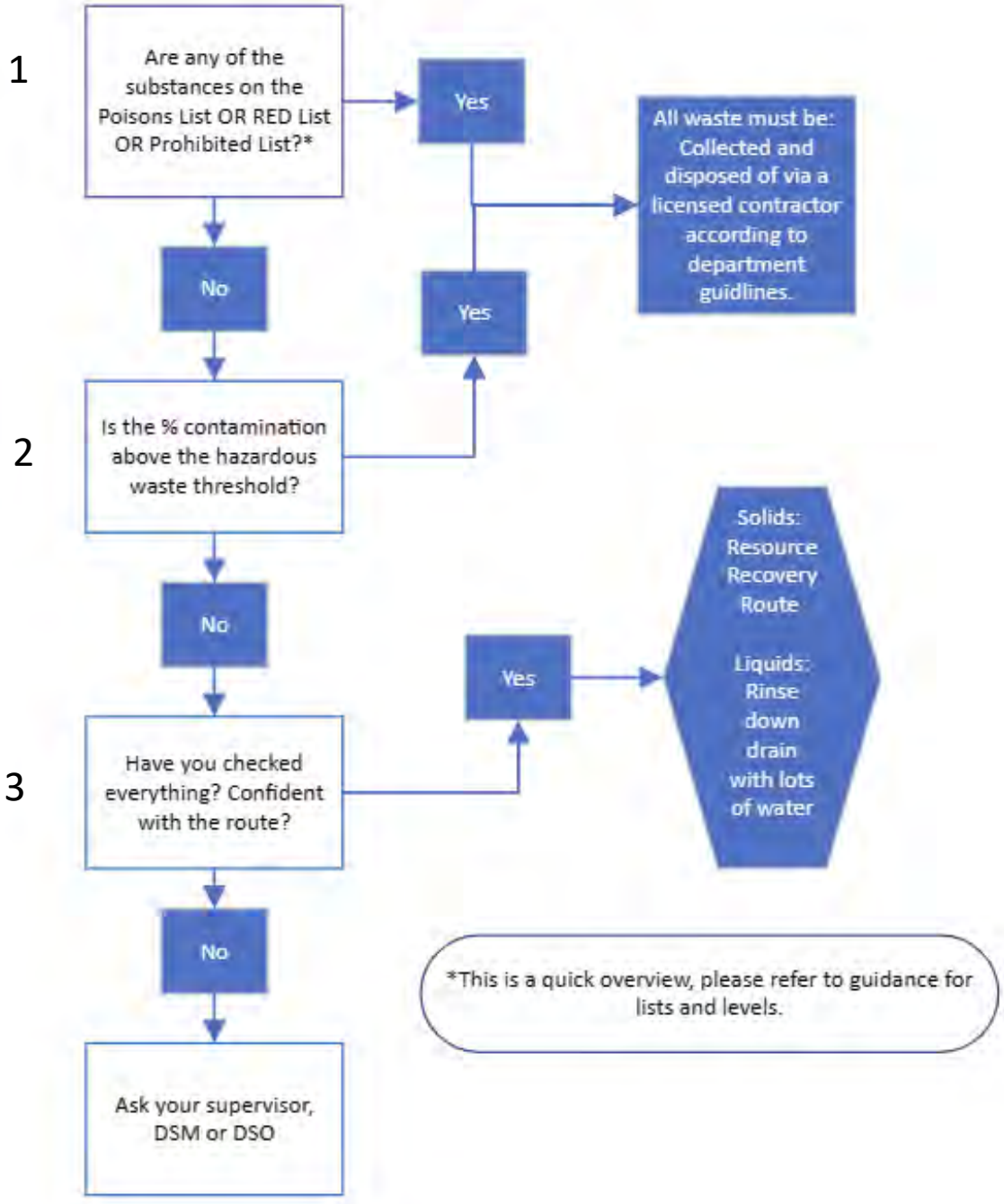
How do you know if your waste is "hazardous waste" ?

This question must be answered as part of the Risk Assessment for the procedure

There are several things to be taken into account shown on this flow chart

# Disposal of items contaminated with HAZARDOUS substances

This must be part of the risk assessment for all procedures



**Question 1.**

**Is the item for disposal contaminated with a substance to which special restrictions apply?**

These are:

- Scheduled Poisons
- The UK RED list
- Local authority prohibited list (Cambridge City Council for solid waste OR Anglia Water for disposal to the **drains**)
- Includes Environmental Hazards (NOT only chemicals!!)

And these are those lists……..

**POISONS INCLUDED IN THE POISONS LIST TO WHICH**
**SPECIAL RESTRICTIONS APPLY**

| | |
|---|---|
| Aldicarb | Oxamyl |
| Aluminium phosphide | Paraquat, *salts of* |
| Arsenic; *its compounds, except substances containing less than the equivalent of 0.075 per cent. of arsenic (As)* | Phosphorus compounds, the following:-<br>• Azinphos-methyl<br>• Chlorfenvinphos<br>• Demephion<br>• Demeton-S-methyl<br>• Dialifos<br>• Dichlorvos<br>• Dioxathion<br>• Disulfoton<br>• Fonotos<br>• Mecarbam<br>• Mephosfolan<br>• Methidathion<br>• Mevinphos<br>• Omethoate<br>• Oxydemeton-methyl<br>• Parathion<br>• Phenkapton<br>• Phorate<br>• Phosphamidon<br>• Pirimiphos-ethyl<br>• Quinalphos<br>• Thiometon<br>• Thioazin<br>• Triazophos<br>• Vamidothion |
| Barium, *salts of (other than barium sulphate)* | |
| Bromomethane | |
| Carbofuran | |
| Chloropicrin | |
| Cycloheximide | |
| Dinitrocresols (DNOC); *their compounds with a metal or a base; except water washes containing not more than the equivalent of five per cent. of dinitrocresols* | |
| Dinoseb; *its compounds with a metal or a base* | |
| Dinoterb | |
| Drazoxolon; *its salts* | |
| Endosulfan | |
| Endothal; *its salts* | |
| Endrin | |
| Fentin, compounds of | |
| Fluoroacetic acid; *its salts; fluoroacetamide* | |
| Hydrogen cyanide *except substances containing less than 0.15 per cent., weight in weight, of hydrogen cyanide (HCN); metal cyanides, other than ferrocyanides and ferricyanides, except substances containing less than the equivalent of 0.1 per cent., weight in weight, of hydrogen cyanide (HCN)* | |
| Lead, organic compounds of | |
| Mercuric *chloride except substances containing less than one per cent. of mercuric chloride;*<br>mercuric iodide *except substances containing less than two per cent. of mercuric iodide; nitrates of mercury except substances containing less than the equivalent of three per cent., weight in weight, of mercury (Hg);*<br>potassio-mercuric iodides *except substances containing less than the equivalent of one per cent. of mercuric iodide; organic compounds of mercury except substances, not being aerosols, containing less than the equivalent of 0.2 per cent., weight in weight, of mercury (Hg).*<br>Metallic mercury is excluded from this list | Strychnine; *its salts, its quaternary compounds; except substances containing less than 0.2 per cent. of strychnine* |
| | Thallium, salts of |
| | Thiofanox |
| | Zinc phosphide |

## UK Red List Substances plus carbon tetrachloride

The UK red list contains 23 substances, the presence of which in the environment is of particular concern

- 1,2-dichloroethane
- Aldrin (and isomer isodrin), dieldrin, endrin
- Atrazine
- Azinphos-methyl
- Cadmium (and its compounds)
- Carbon tetrachloride*
- DDT (all isomers)
- Dichlorvos
- Dieldrin
- Endosulfan
- Endrin
- Fenitrothion
- Gamma-hexachlorocyclohexane (Lindane)
- Hexachlorobenzene
- Hexachlorobutadiene
- Malathion
- Mercury (and its compounds)
- Pentachlorophenol (and its compounds)
- Polychlorinated biphenyls
- Simazine
- Tributyltin compounds
- Trichlorobenzene (all isomers)
- Trifluralin
- Triphenyltin compounds

* Carbon tetrachloride does not appear on the UK Red List but is a prescribed substance listed in Schedule 1 to the Trade Effluent (Prescribed Processes and Substances) (Amendment) Regulations 1990 which comprises of the UK Red List substances plus carbon tetrachloride.

## LIQUID WASTE-

## Local authority Foul sewer prohibited list.

***Absolutely NO:***

| |
|---|
| • Prescribed substances i.e. items appearing on the UK Red Lists or Schedule 1 poisons (see table 1) including their salts (see tables2), e.g.<br>• **Mercury / mercury compounds**<br>• Cadmium / cadmium compounds |
| • Petroleum spirit and other volatile or flammable organic solvents |
| • Calcium carbide |
| • **Cyanides** |
| • Waste liable to form viscous or solid coatings or deposits on or in any part of the sewerage system |
| • **Ethidium bromide buffer solutions and other DNA stains, including Sybr-Green.** |
| • Mineral and synthetic oils |
| • Substances of a nature likely to give rise to fumes or odours |
| • Halogenated hydrocarbons |
| • Halogen substituted phenolic compounds |
| • Thiourea and its derivatives |
| • Solutions containing |
| ○ Antimony |
| ○ Arsenic |
| ○ Chromium (VI) |
| ○ Selenium |
| ○ Tellurium |
| • Organohalogen, organophosphorus or organonitrogen pesticides, triazine herbicides, any other biocides |
| • Poisonous organosilicon compounds, metal phosphides and elemental phosphorus |
| • Spent photographic solutions |
| It should be noted that this list is not exhaustive. |

***Exceptions:***

**The following can be disposed to foul sewer but only with copious amounts of water**:

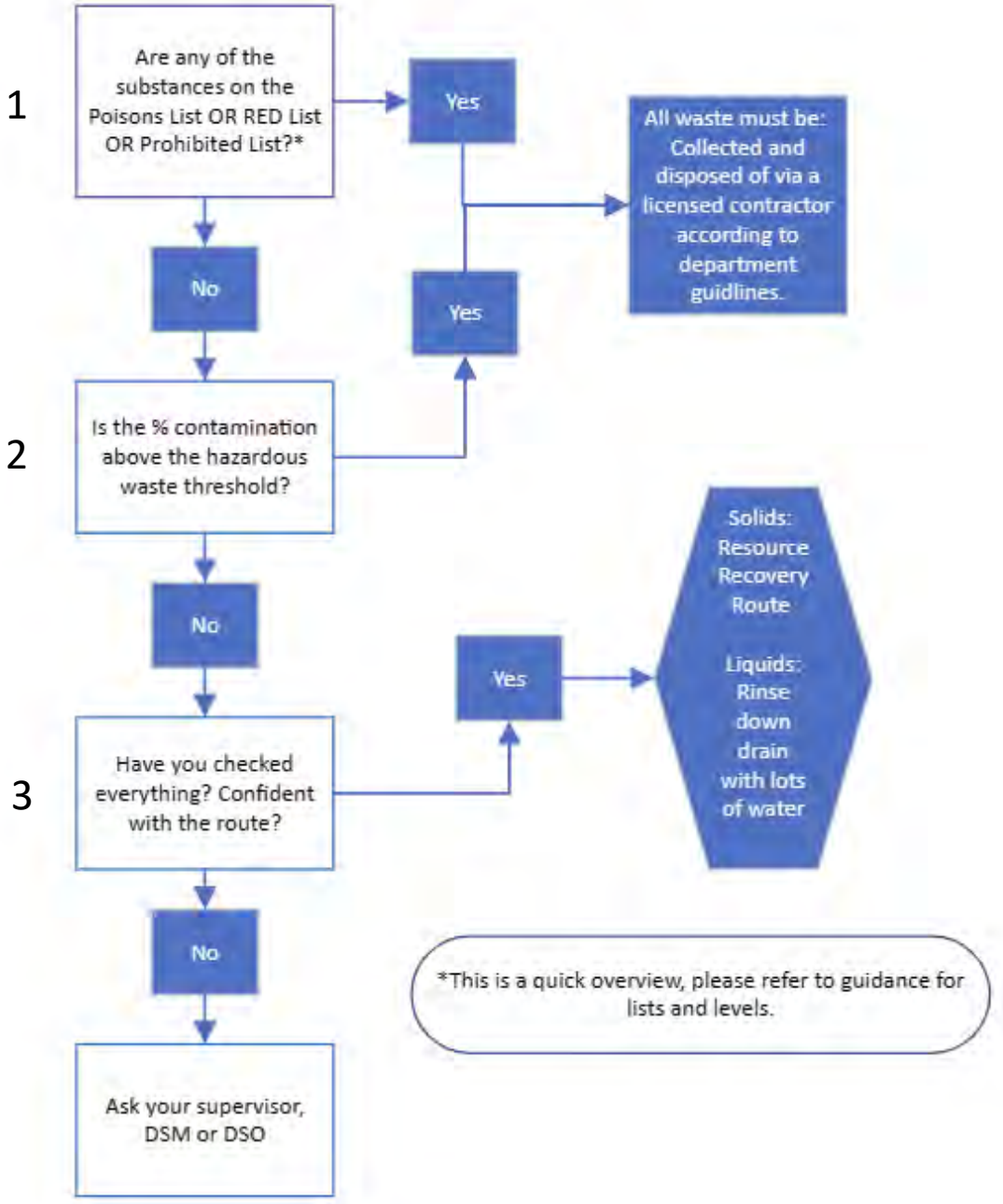
- **Aqueous solutions containing less that 0.01% v/v organic solvents (excluding chlorinated solvents)**
- **Dilute acid, alkali or ammonia solutions (less than 10% v/v)**
- **Harmless soluble inorganic salts (including all drying agents such as $CaCl_2$, $MgSO_4$, $Na_2SO_4$, $P_2O_5$)**
- **Hypochlorite solutions from destroying cyanides, phosphines, etc**

**HOWEVER:**

ENVIRONMENTAL HAZARDS / RISK PHRASES MUST BE CHECKED PRIOR TO DISPOSAL TO FOUL SEWER OF ANY SUBSTANCE.

If the answer to question 1 was NO...

If it is not on the restricted lists



**Question 2.**

Does if it fall above the thresholds for hazardous waste?

| Categories of danger | Hazardous property | Hazardous waste threshold i.e it is hazardous waste and must be disposed of via contractor |
|---|---|---|
| Harmful | H5 | ≥25% |
| Irritant | H4 | ≥10% or ≥ 20% depends on risk phrase |
| Carcinogenic cat 3 | H7 | ≥1% |
| Toxic for reproduction cat 3 | H10 | ≥5% |
| Mutagenic Cat3 | H11 | ≥1% |
| | | |
| Toxic | H6 | ≥3% |
| Very toxic | H6 | ≥0.1% |
| Carcinogenic cat 1 and 2 | H7 | ≥0.1% |
| Mutagenic cat 1 and 2 | H10 | ≥0.1% |
| Toxic for reproduction cat 1 and 2 | H11 | ≥0.5% |
| Oxidising | H2 | See below |

| | |
|---|---|
| **H1** | 'Explosive': substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene.<br>Relevant risk phrases: R1, R2, R3, R4, R5, R6, R9, R16. CHIP- category of danger letter: **(E)** |
| **H2** | 'Oxidizing': substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances.<br>Relevant risk phrases: R7, R8, R9. CHIP category of danger letter: **(O)** |
| **H3-A** | 'Highly flammable':<br>- liquid substances and preparations having a flash point below 21 °C (including extremely flammable liquids), or<br>- substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or |
| | - solid substances and preparations which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the source of ignition, or |
| | - gaseous substances and preparations which are flammable in air at normal pressure, or |
| | - substances and preparations which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities. |
| **H4** | Relevant risk phrases: R11, R12, R13, R14, R15, R17. CHIP category of danger letter: **(F, F+)**<br>'Irritant': non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with the skin or mucous membrane, can cause inflammation.<br>Relevant risk phrases: R36, R37, R38, R41. CHIP category of danger letter: **(Xi)** |
| **H5** | 'Harmful': substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks.<br>Relevant risk phrases: R20, R21, R22, (R39), R40, (R48), R63, R65. CHIP category of danger letter: **(Xn)** |
| **H6** | 'Toxic': substances and preparations (including very toxic substances and preparations) which, if they are inhaled or ingested or if they penetrate the skin, may involve serious, acute or chronic health risks and even death.<br>Relevant risk phrases: R23, R24, R25, R26, R27, R28, (R39, R48). CHIP category of danger letter: **(T,T+)** |
| **H7** | 'Carcinogenic': substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence.<br>Relevant risk phrase: (R40), R45, R49. CHIP category of danger letter: **(T)** |
| **H8** | 'Corrosive': substances and preparations which may destroy living tissue on contact.<br>Relevant risk phrases: R34, R35. CHIP category of danger letter: **(C)** |
| **H9** | 'Infectious': substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms. |
| **H10**[5] | 'Toxic for reproduction': substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may produce or increase the incidence of non-heritable adverse effects in the progeny and/or of male or female reproductive functions or capacity.<br>Relevant risk phrases: R60, R61, R62, R63. |
| **H11** | 'Mutagenic': substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence.<br>Relevant risk phrase: R46, R68. |
| **H12** | Substances and preparations which release toxic or very toxic gases in contact with water, air or acid.<br>Relevant risk phrases: R29, R31, R32. |
| **H13** | Substances and preparations capable by any means, after disposal, of yielding another substance, e.g. a leachate, which possesses any of the characteristics listed above. |
| **H14** | 'Ecotoxic': substances and preparations which present or may present immediate or delayed risks for one or more sectors of the environment.<br>Relevant risk phrases: R50 to R59. |

If the answer to question 1 or 2 is **YES:**

The substance **MUST** be collected by a registered waste disposal company.

**It must be:**

- collected in a suitable container; containers designed for solids must not be used for liquids; the smallest reasonable volume
- labelled with contents- the components and quantities
- Fill out online waste disposal spreadsheet then taken to stores for collection
- taken to stores promptly- waste should not be collected in labs

## Segregate according to chemical compatibility:

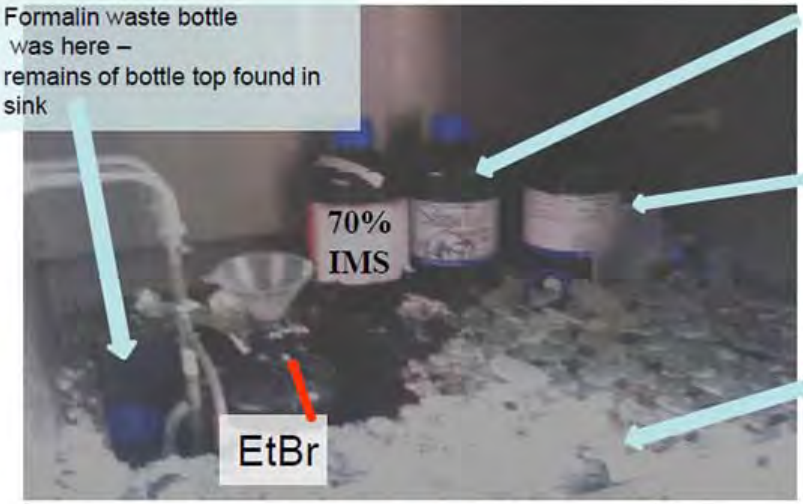
- Mineral separate from organic acids
- Acids separate from cyanides, sulphides and alkalis
- Halogenated solvents separate from non-halogenated solvents
- Pyrophoric substances i.e. substances which are spontaneously flammable in the presence of air and / or moisture e.g. lithium aluminium hydride, butyl lithium, sodium metal, white phosphorus
- Water reactives
- Anything containing iodine or suspected of containing iodine must be segregated and clearly identified
- All oxidisers must be segregated. Care must be taken to ensure that oxidisers do not come into contact

with organic materials and mineral acids

- Non-incineratable wastes such as mercury and cadmium.

**SEGREGATION and SAFE STORAGE are EXTREMELY IMPORTANT. The consequences for not following this guidance can be catastrophic!**

# Waste chemical explosion incident night of 20-21 July 2009

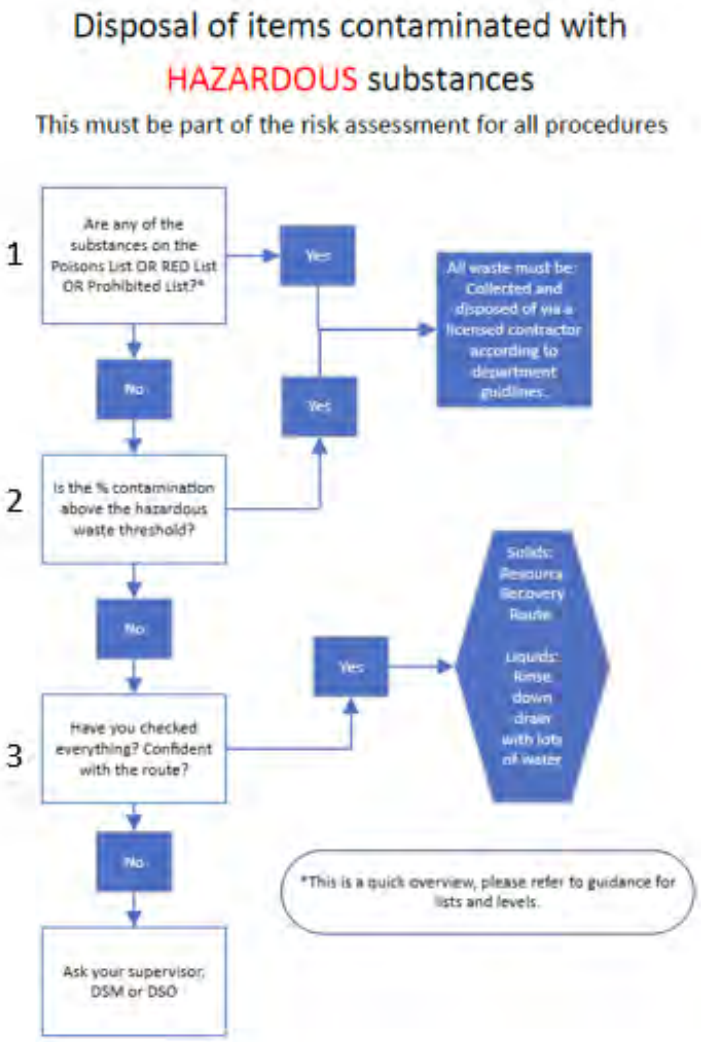



2. Fume cupboard showing blown out sash.

3. Sash glazing and brown chemical bottle glass spread over floor in the 1st bay. Glass projectiles reached into neighbouring rooms and to the far end of lab- ~10 metres away. Benches and floor had some chemical contamination and there was a smell of Phenol in the lab. The fume cupboard was not turned on.

4. A large piece of glass from one of the chemical bottles embedded itself deeply into the back of a vinyl lab chair which was located in the 2nd bay ~ 4 metres from the point of explosion

If the answer was NO, move on to question 3




If the answer to the **question 1 and 2** is **NO.....**

**The item is non-hazardous waste, it may go out in the Resource Recovery streams**

**BUT...**
**If the waste is**

- **likely to pierce a bin bag**
- **in any way likely cause any harm**

**Waste must be contained before being placed into the Resource Recovery so that there is no the risk of exposure to cleaners or risk of contamination to work areas or corridors**

**Guidance for collection and containment can be found on the poster and the online waste guidance**

*Special topic:* ***Ethidium Bromide.***

The use and disposal of Ethidium Bromide was discussed by the safety committee.
It was agreed that suitable, safer alternatives should be used where practical.
The use of Ethidium Bromide is not be prohibited.

As of July 2023, all gels and tips contaminated with concentrated solutions, **MUST NOT** be disposed of via the general waste route. They must instead be disposed of via the hazardous chemical waste route.

Used gels and contaminated tips must be collected in a lined, labelled bucket and the bag sealed up and labelled before disposal. The bag should then be carried in the bucket to Stores for disposal, only after filling in the online waste disposal spreadsheet.

Don't allow large amounts to accumulate before you take the waste to Stores. Removing it regularly is better than collecting a full bin.

All gloves, tubes wipes etc. (with residual contamination) can go out via the Resource Recovery route; contained so there is no risk to the cleaning staff.

# Laboratories

**All waste must be disposed of in a safe and appropriate manner**
**Hazardous material must be doubly contained**
**The route of disposal must be ascertained before work begins as part of Risk Assessment**
**Individuals are responsible for disposing of waste they have generated**

Share responsibility for emptying it between all people who make the waste-
i.e. DO NOT expose one person

**Do**

- **Do use the correct containers; use original containers when possible; check the compatibility of the material, glass or plastic?**
- **Do remove/cover all original labels**
- **Do label all containers with the correct hazard warning and the contents; hazard tape and labels are available from stores**
- **Do transport autoclave waste in the bucket**

**Don't**

- **Do not overfill containers**
- **Do not use a container before it has been correctly labelled**
- **Do not put *loose* disposable pipette tips or pipettes in the non-hazardous waste bins or into autoclave bags**
- **Do not use empty PPE boxes for waste**
- **Do not put incompatible chemicals together**
- **Do not allow waste to accumulate in work areas**

## Laboratories

| | |
|---|---|
| General DRY Waste inc RECYCLING | All general waste including gloves, tips, recycling, paper, packaging, plastics, tip boxes and damp handwashing towels.<br><br>NO GM OR HAZARDOUS WASTE |
| DIRTY/SOILED/WET waste | Wet waste including non-Ethidium bromide gels, compost etc. |

## Offices, Tea Room and Kitchen


Most non-hazardous waste materials are disposed of via the 'Resource Recovery Route'.

Food waste is disposed of via the food waste bins.

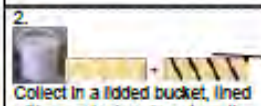
Hazardous materials must not be taken into offices, the tea room, kitchen, toilets, libraries or other unsuitable areas.

Printer cartridges are disposed of via stores.

Batteries are disposed of in the cardboard box on the windowsill near the back door.

UNIVERSITY OF CAMBRIDGE
Department of Plant Sciences

# WASTE - Before you start work know the correct waste routes

| WASTE | TYPE OF CONTAINER and additional information | WHERE DOES IT GO? (USER RESPONSIBLE UNLESS OTHERWISE INDICATED) |
|---|---|---|
| NON - Hazardous Solid Waste<br>This includes lab waste<br>Gloves, wipes etc<br><0.1% Very Toxic<br><1.0% Toxic etc<br>No GM Waste |  Place in bin labelled as *Resource Recovery*. | Collected by the cleaners then placed in Resource Recovery Bin (blue)<br>  |
| Non-contaminated Plastic, Paper, Cardboard Catalogues, books etc. Cans | Collect in Resource Recovery bins<br>Do not allow waste to build up in labs<br>Do not leave in door ways/corridors<br>  | |
| Electrical equipment | Small items<br>Larger items including computers | Yellow WEEE bin in basement.<br>Email – Facilities@plantsci |
| Batteries | Window shelf near facilities | |
| Printer cartridges | Take to stores | |
| *FLUORESCENT TUBES (TEMP)* | *(Normal office lighting)* | Collection bin in basement |
| GLASS (Inc Pyrex and reinforced glass). Uncontaminated | Collect in labs using a labelled white bucket before transferring to glass bins located on each floor. Drinks bottles should be taken to the outside bin directly. | Glass disposal bins are located on each floor of the Botany Building. Seal up and take down to Resource Recovery bin when >half full.<br>  |
| Non-Recyclable (Contaminated) GLASS | Must be disposed of as solid waste according to contamination. | Take to stores for collection by contractor |
|  Empty Winchester and other chemical bottles | May be used to collect the same or compatible liquid waste; if non hazardous they may be rinsed and returned. Always use a bottle carrier to move bottles round the building. | Various routes |
|  HAZARDOUS *1.CHEMICAL* e.g ≥0.1% VERY TOXIC ≥1.0% TOXIC<br>SOLID HAZARDOUS WASTE<br>*2. BIOLOGICAL* | 1. Suitable containers, designed for solids, must be labelled for specific hazard and lined with a plastic bag.<br>Buckets are available from stores for large collections *If necessary*.<br>Must be labelled with contents and amounts. | CHEMICAL only<br>Take to stores for collection by contractor (ensure you have filled out the online disposal spreadsheet) |
| | 2.<br>  <br>Collect in a lidded bucket, lined with an autoclave bag, tape the bag loosely and carry to the autoclave room, *in the bucket*; place the bag in the autoclave room collection bin. Do not fill bags above the top of the bucket. | BIOHAZARD only<br>Take to be autoclaved. After autoclaving, the autoclave techs put it into 'A' Resource Recovery bins<br>**PUT YOUR NAME AND ROOM NUMBER ON ALL WASTE** |
| INCINERATION WASTE<br>  |  Needles, syringe bodies, scalpel blades, some razor blades and material that must be incinerated under license | Take to collection point in autoclave room then autoclaved for collection by contractor |

| WASTE | TYPE OF CONTAINER and additional information | WHERE DOES IT GO? (USER RESPONSIBLE UNLESS OTHERWISE INDICATED) |
|---|---|---|
|  HAZARDOUS LIQUID Chemical<br>Containers must be designed for liquids. | Everything that cannot be put down the drains must be collected in suitable labelled containers.<br>DO NOT overfill. Use original container when possible. Do not mix incompatible substances.<br>Labels available from stores.<br>  | Record on the online disposal spreadsheet.<br>Take to stores for collection by contractor.<br>Use a bottle carrier |
| Gel waste (e.g., Ethidium bromide, Sybr Safe, Acrylamide) | All gel waste must be disposed in bags in a labelled bin. Tips contaminated with concentrated solutions must also be disposed of as hazardous chemical waste. | Record on the online disposal spreadsheet.<br>Take to stores for collection by contractor |
| HAZARDOUS LIQUID Biological | WASTE. Must be collected in a flask or bottle, autoclaved then rinsed down the sink<br>  | User to collect from autoclave room and rinse down lab sink<br>  |
| NON-hazardous LIQUIDS; including DEACTIVATED chemicals and DECONTAMINATED liquid cultures | (a validated method must be used e.g. the autoclave process for bacteria cultures)<br>  | User.<br>Down lab sink with lots of water<br>  |
|  PIPETTE TIPS<br>  | Collect according to hazard in empty chemical pots or red/blue top jars are available from stores<br>  <br>Biological:<br>Place closed container into autoclave bag. Do not put tips directly into autoclave bags as they can pierce the bags and be hazardous to autoclave technicians. | Chemical:<br>Label (available from stores) and take to stores – collection by contractor<br>Biological:<br>Take to be autoclaved.<br>-then 'A' Resource Bin by Facilities staff |
| | Non-hazardous-waste tips:<br>Do not put loose tips directly into bins as they can pierce the bags and be hazardous to cleaners | Non-hazardous:<br>Resource Recovery bins |
| | RADIOACTIVE filter tips may be placed in bags in a beta box<br>-non-filter tips should be washed and placed in Resource Recovery (as deactivated) according to local rules.<br>  | Radioactive: Waste taken down to Radioactive Waste store for collection by University. |
|  Other Pipettes | Biological: collect in a sturdy cardboard box lined with an autoclave bag-put box in another autoclave bag LABEL as pipettes.<br>Non-hazardous collect in a sturdy cardboard box lined with a bag- tape boxes before putting in Resource Recovery<br>Chemical: collect in a suitable container. | As pipette tips |
| You must be trained and must read the local rules before working with RADIOACTIVE substances.<br>Ensure you know how to handle radioactive waste before starting your experiment. | | |
| NEVER use packaging for PPE (e.g. glove boxes) to collect waste. | | |

**DO NOT ALLOW WASTE TO BUILD UP IN WORK AREAS- REMOVE REGULARLY; DO NOT OVERFILL BINS; DO NOT OVERFILL BOTTLES; LABEL EVERYTHING CORRECTLY; USE WHITE BUCKETS FOR SOLID HAZARDOUS WASTE**

NB. Changes to waste arrangements are inevitable and this information will be reviewed and updated regularly:

10 April 2010 *Reviewed, with changes, 22 July 2011; February 2012; Sept 2014; Dec 2016, August 2022,Oct 2022, Feb 2024*

For more waste and recycling information:

http://www.environment.admin.cam.ac.uk/files/waste_management_powerpoint_29th_june_2016.pdf

http://www.safety.admin.cam.ac.uk/publications/hsd018c-disposal-chemical-and-laboratory-waste-policy

https://www.plantsci.cam.ac.uk/intranet/health-and-safety/waste

http://www.plantsci.cam.ac.uk/intranet/support/energy/news

## 6 Acknowledgement Form

After you have read the Induction Handbook, please sign this digital form to acknowledge you have read and understood the information provided.

https://cambridge.eu.qualtrics.com/jfe/form/SV_ddpgXQEoPrhnA8e

## 7 Inductions and Forms to fill in

**List of Inductions and forms for Department of Plant Science members and for long-term research visitors:**

***If you are an undergraduate student, please see the next section***

## Everyone:

### Completion of HR Induction Checklist

This is provided by HR/Admin and contains key documents to be read and tasks to be completed during your first month in the department.

### Completion of Safety Inductions

You will need to read the department's Induction Handbook and complete the confirmation at the end of the document

You will need to attend the health and safety induction talk and sign the register. These are usually held on the first Tuesday of each month. Dates for forthcoming talks can be found on the Safety Noticeboard.

Complete your 'Personal Safety Training Record' form (yellow)

**Long term research visitors need to complete the above safety inductions.**

### Compulsory online training:

Fire Safety online training.
When registering use "Botany Building (DO13)" and "Department of Plant Sciences"

Cyber-security online training

### For display screen users:

Anyone who uses a display screen (e.g., laptop, PC or tablet) for at least an hour a day must complete a Display Screen Equipment (DSE) assessment. Return completed forms to safety@plantsci.cam.ac.uk.

### To work out of hours

Working-out-of-hours permit

Online: Lone Working training

**Your Head of Group or Line Manager needs to fill in the form for your permit to be valid**.
You will receive further information on this once you fill in your permit form above.

## Research and Research-Related Laboratory Staff:

In addition to the training for everyone:

**Compulsory online training**:

Chemical Safety online training
Glass & Sharps Hazards Training

**Role-dependent training**

Using liquid nitrogen safely
Using Compressed Gases

**To work with biological material.**

Read the 'Biological/GM Code of Practice' and complete the confirmation form at the end.

Your Head of Group will need to complete a 'Bio/GM Worker Approval Form' for you which is submitted to the Biological Safety Committee.

**To work at the Plant Growth Facility**

Facility Induction by PGF Facility Manager
Read 'Growth Facilities: Services and User Responsibilities' and risk assessment documents.

Read 'PGF Orientation Slides' and complete PGF quiz via Moodle (link at end of slides). Full marks (28) must be achieved to obtain a pass. Completion of the quiz will trigger Reception to add access to the PGF to your university card.

## Other role-dependent training courses include:

Lifting and Manual Handling Training – arranged by Department Safety Manager
Work at Height Training – arranged by Department Safety Manager
Shipping Biological Materials (IATA)
GM Risk Assessment
Radiation

## Staff and students based in the David Attenborough Building (DAB)

Staff and students who are members of the Department of Plant Sciences but who are based in the DAB will need to complete the relevant building induction for the DAB, however they will also need to attend our Health & Safety Induction talk.

## Postgraduate Students

Postgraduate students are required to complete the online 'Staying Safe at the University of Cambridge' course. This should be completed before starting your research activities. They must also complete the mandatory training listed above for all new starters and research laboratory workers as appropriate.

### Part II, Part III and Summer Students

Please note, undergraduate students are not permitted to work in the department out of hours, even if they are accompanied. They must only work during core hours and be accompanied at all times.

Before starting work in the department:

1) Read the Induction Handbook and complete the confirmation at the end of the document. Attend an in-person health and safety induction talk and sign the attendance form.
2) Complete your 'Personal Safety Training Record' form (yellow)

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List of key documentation available online and in your group's safety information:

- Biological Safety Committee: Code of Practice for working with GMOs
- Chemical Safety
- Departmental procedures for transport of biological materials
- Display Screen Equipment
- Gas and Pressure Systems
- Growth Facilities: Services and User Responsibilities
- Manual Handling
- Personal Protective Equipment
- Risk Management
- Waste Disposal Policy

For further information on Health and Safety contact the Health and Safety Office:

Safety Office
Greenwich House
Madingley Road
Cambridge CB3 0TX
Tel: 01223 333301
Email: safety@admin.cam.ac.uk
Web: https://www.safety.admin.cam.ac.uk/
Director of Health & Safety: Martin Vinnell (3)39512
hsd_director@admin.cam.ac.uk

| | BT Phone | Network extn |
|---|---|---|
| Accident and Emergency Dept., Addenbrooke's Hospital, Hills Road, Cambridge | 01223 245151 | |
| Emergency Services: Ambulance, Fire Brigade, Police | 999 | 999 |

NB. Emergency service number 999 can be called on any handset within the Department

## EMERGENCY CONTACTS

| | | | |
|---|---|---|---|
| Security (out of hours) | | | 31818 |
| Emergency | | | 101 |
| | | Room | Extn |
| Fire Manager & Principal Technician: (01223 333947) | Anna Gordon | 112 | 33947 |
| Departmental Safety Officer (DSO) | John Carr | 120 | 66416 |
| Departmental Safety Manager (DSM) | Martyn Balmont | 320 | 30223 |
| Biological Safety Officer (BSO) | Martyn Balmont | 320 | 30223 |
| Radiation Protection Supervisors (RPS) | John Carr | 120 | 66416 |
| | Martyn Balmont | 320 | 30223 |
| Laser Safety Officer (LSO) | Facundo Romani | 208 | 66545 |
| Building Repairs etc. email: | facililtes@plantsci.cam.ac.uk | | |
| Departmental Administrator | Catherine Butler | 127 | 33909 |
| Deputy Departmental Administrator | Del Hawtin | 124 | 33916 |
| Computing problems email: | computing@plantsci.cam.ac.uk | | |

## FIRST AIDERS

| | | Room | Extn |
|---|---|---|---|
| Chief First Aider | Barbara Landamore | G15 | 33927 |
| First Aiders: | Matthew Stancombe | 208/G15 | 33928/27 |
| | Susan Stanley | 101 | 30220 |
| | Stephanie Topp | 303 | 48979 |
| | Tomasz Dyl | Stores | 33910 |
| | Martyn Balmont | 320 | 30223 |
| | Nigel Boulding | PGF | 67820 |