

Chemical Safety Policy
Queen Mary University of London
Health and Safety Policy

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1.0 Executive Summary

1.1 This Health and Safety Policy establishes the framework for the effective risk assessment, health & safety risk controls and measures to be adopted and implemented for work with hazardous chemicals by Queen Mary staff, students; and others or the environment who/which may be affected by Queen Mary activities. The objective of the Policy is to control and reduce and where significant, eliminate the risks and to ensure compliance with the legislation governing work with hazardous chemicals.

1.2 The Policy defines the management of hazardous chemicals and safe working arrangements in the context of Queen Mary's activities. It identifies the roles and responsibilities for Heads / Managers / Supervisors of Schools / Institutes / Directorates conducting the work and for Queen Mary staff, students and others or the environment who/which may be affected by the work and notes the key legal and compliance requirements specified in the relevant health and safety legislation and supporting guidance. Specific notification requirements to the regulators are identified along with enabling Queen Mary procedures.

1.3 This version of the Policy has been issued following Queen Mary wide consultation and approval by the Queen Mary Health & Safety Advisory Group in (TBC)

2.0 Introduction

2.1 Queen Mary University of London (Queen Mary) has a longstanding history of teaching and research requiring the use hazardous chemicals. E.g. laboratory chemicals.

In addition, the development and maintenance of the University campus requires the use of substances that also have the potential to cause harm, though their potential to do so may be less immediately obvious. E.g. cleaning products.

2.2 Such activities have an inherent risk of accidents where harm may occur through a number of routes.

- Acute health effects e.g. corrosives and toxic materials.
- Chronic health effects which can take years to develop. This contains obvious materials like carcinogens, and sensitisers. But in addition, some common materials can cause issues e.g. skin reactions to products like flour over a long period.
- Through supporting or promoting fire. Includes oxidising agents like oxygen as well as flammable liquids which can cause rapid fire to spread.
- Asphyxiants. Materials like liquid nitrogen can replace atmospheric oxygen in poorly ventilated spaces and lead to death.
- Physical damage. This would include corrosives which can damage equipment and items such as drainpipes.
- Explosions. Includes explosive gases if they leak into a poorly ventilated space.
- Damage to the environment. Poor waste disposal: loss of containment e.g. leaks of diesel into drains; inappropriate use of insecticides and similar in managing our grounds.

2.3 The benefits of the educational and research activities to the University and wider society must be weighed against the risks. As a responsible institution, we seek to understand the nature of the risk, it's magnitude and take necessary steps to control it to a tolerable level.

- 2.4 This policy informs the structures and processes that the University uses to
- identify and characterise risk.
 - minimise risk to tolerable levels.
 - take remedial action when required.
 - educate and inform staff, students, and others regarding their responsibilities.
 - interact with regulators.
 - Align with the University Sustainability policy e.g. waste disposal processes.

3.0 Purpose

3.1 To reduce, as far as reasonably practicable, the likelihood of damage to persons, property or the environment through activities involving the use of hazardous chemicals.

3.2 To promote best practice and a sound understanding of applicable legislation and derived guidance relating to the use of hazardous chemicals.

3.3 To ensure full statutory compliance with applicable legislation.

4.0 Scope

4.1 This Policy applies to all Queen Mary staff, postgraduate and undergraduate students, and others (e.g. academic or teaching visitors and contractors) who are to conduct activities at Queen Mary with hazardous chemicals, and to all others who may be affected by Queen Mary activities involving such substances.

4.2 The Policy applies to all activities which involve the use of all hazardous chemicals.

4.3 This Policy is applicable to all Queen Mary campuses and premises within the UK and EU. Outside of these regions local rules differ significantly and should be followed, although the overall aim and intention of the policy must still apply.

4.4 This Policy document does not deal with the following materials or substances, which are addressed in separate Queen Mary Health & Safety Policy or Guidance documents:

- Biological material, pathogens or agents which may constitute a hazard to health.
- Radioactive materials
- Asbestos
- Compressed gas hazard caused by physical harm, e.g. high pressure, mechanical injury. (although it does consider its ability to cause harm through exposure, asphyxiation, fire or explosion)
- Note there are also overlapping Queen Mary H&S policies where safe use of substances and detailed processes for health & safety are also specified: Personal Protective Equipment, Local Exhaust Ventilation (LEV), Health Surveillance and Monitoring, Cryogenic Liquids and Solids and procedures for transporting of dangerous goods.

4.5 Whilst the Policy does identify the need to minimise our negative impact on the wider environment this concept is covered in much more detail in our Sustainability Policy. The focus of this policy on the environment is prevention of harm through the uncontrolled release of hazardous chemicals.

4.6 The policy is intended to identify and delineate areas of responsibility rather than provide a guide to best practice in the use of chemicals. Various training courses and guidance documents are provided elsewhere.

5.0 Legislation

5.1 Enacted under the Health and Safety at Work *etc* Act 1974, The Control of Substances Hazardous to Health (COSHH) Regulations 2002 (as amended) requires the use of substances which may cause harm to health in the workplace to be controlled. This is the principal regulation which governs the use of chemicals within the workplace.

5.2 Additional legislation which place constraints on the use of certain chemicals include-

- The Classification, Labelling and Packaging of Substances and Mixtures (Amendment and Consequential Provision) Regulations 2023
- Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009
- Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002
- The Regulatory Reform (Fire Safety) Order 2005
- Environmental Damage (Prevention and Remediation) (England) Regs 2015
- The Hazardous Waste (England and Wales) Regulations 2005
- Environmental Protection Act 1990
- The REACH *etc.* (Amendment *etc.*) (EU Exit) Regulations 2019
- Control of Lead at Work Regulations 2002
- Council Directive 2004/37/EC - carcinogens, mutagens or reprotoxic substances at work
- Council Directive 92/85/EEC (of 19 October 1992 on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding)
- Misuse of Drugs Act 1971 and Schedules 1-5 of the Misuse of Drugs Regulations 2001
- EC Regulation No 273/2004 (Governing procurement and supply of drug precursors)
- Explosives Regulations 2014
- Anti-terrorism, Crime and Security Act 2001
- The Control of Explosives Precursors and Poisons Regulations 2023
- Chemical Weapons Convention (CWC) 1997
- The Fluorinated Greenhouse Gases Regulations 2015
- The Ozone-Depleting Substances Regulations 2015

6.0 Terms and Definitions

6.1 **Hazardous chemical refers to.**

- All chemical substances classified as hazardous under the Classification, Labelling and Packaging of Substances and Mixtures (Amendment and Consequential Provision) Regulations 2023.
- Any substance or mixtures of which have the potential to cause harm to health if they are ingested, inhaled, or are absorbed by, or come into contact with the body.
- Substances that due to their chemical properties or the way in which they are used or present in the workplace pose a risk of injury, fire, or explosion.

- Any material which if discharged in an uncontrolled manner may cause harm to the environment.

It must be noted that in some cases the chemical hazard is not obvious and arises from a change of form to the substance due to a process or repeat exposure.

For example-

- Grinding of stone to generate respirable silica dust which may cause lung disease.
- Repeated dermal exposure to cleaning products leading to dermatitis and sensitisation.
- Laser cutting of steel generating nickel and chrome vapour, presenting serious long term health effects.

6.2 Regulated substances refer to substances whose manufacture, possession and use are governed by additional specific legislative controls e.g. controlled drugs

6.3 Hazardous waste: substances no longer required that are categorised as hazardous by the Waste Catalogue and require disposal by a specialist contractor.

6.4 Local Exhaust Ventilation (LEV): a range of engineering controls that reduce exposure from harmful chemicals they are working with, typically using fans and ducting to create a pressure differential which removes dust, fume or vapour away to a safe location. The most common example are fume cabinets.

6.5 Laboratories can refer to:

6.5.1 Wet labs

Laboratory space designed to support routine work with hazardous chemicals. Whilst the exact specifications will vary according to need there are minimum standards which must be met before the space can be considered a wet lab. Work surfaces and floors will be suitably chemical resistant, sealed to prevent spillages escaping. There will be suitable provision of chemical / equipment storage, LEV, services. There is a requirement for hand wash sinks. Ventilation should be between 6-11 air changes per hour.

There is a crossover between the concept of Wet Lab and Containment Lab, a more detailed specification for laboratories working with biological material, see the Biological Safety Policy. Containment Laboratories are typically suitable for some work with Hazardous Chemicals subject to risk assessment.

The expectation is that most research and teaching activities covered by this policy will take place ONLY in designated laboratories.

6.5.2 Dry labs

A laboratory space primarily used for analytical equipment or work with electrical equipment e.g. Scanning Electron Microscopy or X-ray Diffraction:

Limited, small scale chemical use is suitable in this space. Typically, prepared samples are bought here from Wet Lab spaces. Use of solvents will be minimal. LEV may not be required, depending on usage. Ventilation will be less important. The space may require use of compressed or cryogenic gases.

6.5.3 Workshop

A space primarily used for use of mechanical tools e.g. saw, drills, lathes. Hazardous chemical use in this space will be limited to proprietary mixtures intended for lubrication, cleaning, or manufacture. The use of tools may generate fine dusts or powders of hard wood, silica etc which are hazardous. Workshop spaces typically require LEV to deal with dust, fume, and vapours. Consideration must be given to storage of products which may be flammable or product toxic vapours.

6.6 Chemical handling equipment

Any equipment used for the processing, storage, separation, reaction, distribution of hazardous chemicals. This covers a wide range of equipment such as glove boxes, rotary evaporators, pumps, reactors, spray guns. All equipment must be certified as safe to use for the intended purpose by the risk assessor and must be maintained appropriately and inspected before use. Only to be used by suitably trained persons. Other regulatory requirements may need to be considered, including but not limited to Provision and Use of Workplace Equipment Regulations 1998 (PUWER), Control of Noise at Work 2005 regulations, and the Pressure Systems Safety Regulations 2002 (PSSR)

6.7 Use

In this instance refers to all activities that occur whilst the hazardous chemical is on the property of Queen Mary, e.g. from when it is delivered onto campus to the point it is disposed of.

6.8 HSE

Health and Safety Executive - the enforcing body for compliance with the Health and Safety at Work Act *etc* 1974.

7.0 Roles and Responsibilities

7.1 Queen Mary Head of School or Directorate / Director of Institute

7.1.1 It is the responsibility* of the Head of School / Directorate or Director of Institute to ensure that where staff or students use hazardous chemicals:

**Responsibilities can be delegated to a competent person, typically to a Principal Investigator or Laboratory Manager etc, however ultimate accountability remains with the responsible person.*

- Staff with supervisory health & safety responsibilities are appointed, trained and are competent for the work involving hazardous chemicals (e.g. responsible academic or teaching staff member, lab manager).
- Staff with allocated health and safety responsibility will verify that contactors they authorise to undertake work which utilises hazardous chemicals are sufficiently competent to undertake such tasks and review their risk assessments prior to work starting.
- A framework for the School / Directorate / Institute is in place for the drafting, dissemination, implementation and review of risk assessment/s and local procedures ('safe systems of work') for working with hazardous chemicals and for the facilities / infrastructure, in line with Queen Mary policy, arrangements and guidance.
- A system is in place for the collection of hazardous chemicals, their safe storage and timely disposal by an authorised contractor via the Health & Safety Directorate (HSD) Chemical Waste Lead.
- Appropriate resources (including budgetary allocations) are provided for laboratories; related infrastructure, equipment and consumables for the work in order to minimise risks to staff, students and others / environment to a tolerable level.
- A framework for the training of all users of hazardous chemicals is in place and that training is recorded (including training needs assessment, initial and refresher training- refer to the [H&S Training & Competency policy](#))
- All accidents and incidents involving hazardous chemicals are reported as per the [Queen Mary Accident & Incident Policy](#),
- Sufficient resources are given to developing and practicing local emergency response.
- Collaboration takes place with Estates & Facilities (EAF) Fire Safety Operations Manager and the relevant HSD Safety Manager to keep an up -to- date list of hazardous chemical information within the Premises Information Box (PIB) for buildings which they are responsible for.
- Cooperation is established with Queen Mary Estates & Facilities to conduct necessary planned preventative maintenance schemes for Wet Laboratories and equipment.
- Where a Queen Mary School / Institute occupies 'embedded space' within another organisation's premises, to ensure that risks arising from hazardous chemical use and storage are communicated to partner organisations in a suitable format, and actions are completed to minimise the identified risks.

7.2 Queen Mary Estates & Facilities – Capital Projects and Infrastructure Maintenance

7.2.1 It is the responsibility* of the Director of Estates & Facilities to ensure that they

** Responsibilities can be delegated to a competent person, typically to a project or campus maintenance manager etc, however ultimate accountability remains with the responsible person.*

- Select and employ competent contractors in line with applicable Queen Mary H&S policies for contractors.
- Ensure that a Laboratory or Facility built or re-fitted as part of a Capital Project is installed in accordance with relevant health and safety regulations and appropriate industry/sector standards.
- Ensure that suitable commissioning of the Laboratory is carried out and that the relevant handover documentation is provided to the facility manager or responsible person.
- Ensure that the handover documentation is forwarded to Estates Infrastructure Maintenance, and that details of any newly installed LEV are entered on the Queen Mary asset register.
- Ensure that the parts or equipment corresponding to Laboratory / workshop under their remit is maintained in accordance with all relevant health and safety regulations and appropriate industry / sector standards.
- Have planned preventative management plans in place for parts of equipment in the Laboratories or workshops within their remit for local inspections and checks, statutory testing and where required, servicing and repairs. That they are conducted within specified timescales, and records are available for Queen Mary and Regulatory Authority audits and inspections.
- Have a Permit to Work system in place to ensure service engineer / examiner safety during testing / servicing and to ensure return of the system in a safe condition.
- Verify the competency of contractors who maintain LEV and compressed gas distribution systems.
- Maintain operating instructions and other documentation relating to Laboratory/ workshop facilities within their remit where it can be readily accessed (electronically or hardcopy).
- Ensure all staff whose work means they may foreseeably be exposed to hazardous chemicals (e.g. working within a laboratory) receive the appropriate level of training such that they understand the risk and how to control it.
- Ensure all EAF staff or appointed contractors who use hazardous chemicals are part of their role are competent to do so.
- Where a significant risk relating to hazardous chemicals has been identified as part of a work plan, a COSHH assessment is in place prior to the start of work.
- Refer staff to occupation health where this need is identified by the COSHH assessment and by legislation / Queen Mary Health Surveillance policy.
- Ensure all statutory records pertaining to their work are kept and communicated to the regulator in good time.
- Designate adequate space and resources for the safe storage of hazardous chemicals within their remit.

7.3 Queen Mary Managers / Supervisors/ Principal Investigators

7.3.1 It is the responsibility of a Manager / Supervisor. Principal Investigators to ensure that:

- Appropriate risk assessment/s for work with hazardous chemicals are made and recorded and kept up to date by periodic review. Where revisions are made, all persons who may be directly affected (i.e. those working with that procedure, or in the case of high residual risk those who are working in proximity)
- The Hazardous Substance based risk assessment template provided by HSD should be used in conjunction with other specialist risk assessments as necessary. The assessment must be uploaded to the University safety management software system MySafety to ensure ease of distribution and evidence of affected persons being adequately informed of changes.
- The risk assessment should be periodically reviewed and updated as necessary over the active life of the work as per Queen Mary Policy. The frequency of review will scale with residual risk. The expectation is that an incident will automatically trigger a review of all relevant risk assessments.
- Intention to start new work that involves a) high residual risk b) regulated chemicals c) hazardous work with carcinogens, mutagens, reprotoxic (CMRs) or sensitising agents is first discussed with the University Chemical Safety Adviser.
- They notify their HSD Safety manager and the Fire Safety Team of the intention to make use of any compressed gas cylinder containing highly flammable or oxidising gases prior to purchase.
- Storage of hazardous chemicals is carried with reference to applicable legislation and guidance. The quantity, type, location etc should be accurately recorded using an inventory managements system. Safety Data Sheets must be retained. Stocks must be managed to minimise the quantity held with reference to the historic patterns of usage. Access to stocks of hazardous chemicals must be limited in accordance with their likelihood of causing harm or being the target of theft.
- Restrictions are placed on the purchase of hazardous chemicals to limit their use to authorised persons and limit the quantity held on site to what is necessary considering the risk of storing them and the cost of disposing of them.
- Staff are trained sufficiently in the Queen Mary hazardous waste disposal procedures and strictly observe the requirement to label all substances adequately.
- Ensure staff and students are aware of the requirements of Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations 2009 that apply to their activities.
- Following training needs assessment, all users of hazardous chemicals receive appropriate training (initial and refresher). Users must be competent to carry out the intended work. Where *independent* work with hazardous chemicals takes place the staff member or post graduate researcher must pass the HSD course HS005 “Hazardous substances risk assessment” before being given unrestricted access to the laboratory.
- All accidents and incidents involving hazardous chemicals are reported as per the [Queen Mary Accident & Incident Policy](#).
- Formal Induction procedures are in place for each laboratory space tailored to staff, students, contractors/engineers, and visitors. Records are kept.

- Local emergency and assistance procedures (e.g. appropriate first aid personnel and procedures, spill procedures, rescue procedures) are in place and that these are tested by a simulated exercise periodically for effectiveness.
- Ensure that all users are fully aware of applicable hazard warning systems (e.g. Low oxygen alarm) and know how to respond safely in an emergency.
- Working practices are periodically monitored for compliance with applicable health & safety legislation requirements and Queen Mary / local written laboratory / facility rules, and where applicable, manufacturer's operating instructions.
- Take reasonable steps to prevent access to laboratory spaces or chemical storage areas to persons who are not suitably inducted or trained, especially where supporting visitors from other Schools or Institutions.
- Health monitoring and surveillance measures are implemented where a need is identified via the job hazard form and/or in the hazardous substance / task risk assessment and/or per legislation or HSE / healthcare professional guidance and are implemented with the Queen Mary Occupational Health service assistance as per process on the [health surveillance and monitoring](#) webpage. Where identified for health surveillance, the individual's health exposure record is kept by the individual concerned using the provided Queen Mary template and stored securely for the required period of time as required by legislation.
- Appropriate local rules and standard operating procedures are written, reviewed and provided to lab users.
- All engineering controls, chemical handling equipment and PPE identified in the risk assessment/s and protocols are correctly set up, maintained and tested (where stipulated, via planned preventative maintenance) and that these control measures are locally checked and inspected periodically for effectiveness. These include equipment such as fume cabinets, reactors and respirators.
- Ensure full compliance with the [Queen Mary Local Exhaust Ventilation](#) guidance.
- Maintain operating instructions and other documentation relating to LEV, chemical handling equipment and warning systems where they can be readily accessed (electronically or hardcopy).
- Where a defect / failure is identified with LEV, chemical handling equipment or warning systems, to identify remedial or corrective actions and implement without delay. Where remedial action for a safety measure is not in their control, to report defects / failure to the appropriate Queen Mary department or in the case of embedded space, to the host organisation responsible person as soon as possible for action.
- Condemned or failed LEV or chemical handling equipment is taken out of use until full repair and safety checks have been satisfactorily made and that no unsolicited modifications are carried out to containment equipment or systems that are likely to render them unsafe.
- Liaise with EAF Campus Maintenance managers to communicate the need for statutory or reactive maintenance (for EAF managed equipment) in good time to facilitate effective organisation.
- Have a Permit to Work system in place to ensure service engineer / maintenance operative safety during testing / servicing of applicable LEV or equipment that is used with hazardous chemicals and to ensure return of the system to a safe condition.

7.4 Users of hazardous chemicals at Queen Mary

7.4.1 It is the responsibility of users of hazardous chemicals to ensure that they

- Take reasonable care of their own health and safety, and that of others who may be affected by their work. This is achieved by following the local safety rules & instructions, understanding the risk assessment findings, attending mandatory and other appropriate training for the work, in line with Queen Mary Policy and arrangements.
- To use all safety and protective equipment (equipment and/or personal protective) appropriately in line with manufacturer's information and local risk assessment / instructions.
- Know and understand the limitations for health and safety when working with hazardous chemicals, and know and understand safety critical features of equipment, personal protection and hazard warning alarms and emergency procedures.
- Ensure they undertake training identified as necessary and periodic refreshers as required. The HSD course HS005 "Hazardous substances risk assessment" is mandatory for all working independently with hazardous chemicals.
- Report all accidents and incidents involving hazardous chemicals as per the [Queen Mary Accident & Incident Policy](#).
- Report any defects with equipment or deficiencies in work practices to their Manager / Supervisor as soon as possible for remedial action.
- Do not use failed or condemned equipment until they are repaired and fully fit for use.
- Do not ignore or misuse anything provided for user health and safety during the work (e.g. not to mute hazard warning alarms of a fume cabinet and then continue to handle hazardous chemicals within it).

7.5 Queen Mary Chemical Safety Adviser

7.5.1 It is the responsibility of the Chemical Safety Adviser to

- Provide Queen Mary with Policy and Guidance, tools and templates for the risk assessment, safe handling, use, safe disposal and transport of hazardous chemicals.
- Provide competent chemical safety advice to Heads of Schools or Directorates / Director of Institutes and their nominated duty holders, on legislative requirements and best practice.
- Establish and co-ordinate registration procedures such that use of regulated substances are notified to the overseeing body at defined points and declarations made as required. e.g., purchase of an Ozone Depleting Substance (ODS) chemical.
- Be the point of contact for the national regulators for all chemical safety matters, and report findings as required by legislation, codes of practice or policy, to the enforcing authorities (in particular, the Health and Safety Executive).
- Inspect and monitor Queen Mary systems and procedures for use of hazardous chemicals in line with the topic and H&S Audit and Inspection Policy and provide recommendations to improve chemical safety.

- Facilitate and/or provide training for the safe use of hazardous chemicals by Queen Mary staff and students.
- Liaise with the Queen Mary Estates & Facilities, and other duty holders with regard to provide competent advice on health and safety legislation and standards for Laboratories, advise on the suitability of proposed facilities for intended use of hazardous chemicals and related design, installation, commissioning, maintenance and decommissioning.
- Liaise with the Queen Mary Occupational Health Service with regards to occupational health surveillance and monitoring for hazardous chemicals where necessary.
- Keep their own competency, training, knowledge and experience up to date.

7.6 Queen Mary Safety Coordinators

7.6.1 It is the responsibility of Safety Coordinators to:

- Proactively monitor compliance with Queen Mary policy and guidelines within users of hazardous chemicals, in particular compliance with local rules.
- Act as a point of first contact within their department for concerns relating to the safe use of hazardous substances.
- Investigate reported incidents relating to the use of hazardous substances in conjunction with HSD.

7.7 Queen Mary Occupational Health Service

7.7.1 It is the responsibility of the Occupational Health Service to:

- Establish and maintain systematic [health surveillance and monitoring](#) activities which involves obtaining information about staff and student's health and which helps protect them at an early stage from use of hazardous chemicals during work or study.
- Keep appropriate records of Queen Mary staff who have been working with hazardous substances with the potential for long term health effects which may not immediately manifest.
- Collection of data for detecting or evaluating health hazards involving work with hazardous chemicals.
- In conjunction with the Chemical Safety Adviser, evaluating control measures against chemical exposure, and highlighting defective or insufficient measures for remedial action.

8.0 Policy / Operational Arrangements

8.1 Risk assessment

By law, a suitable and sufficient risk assessment must take place before work with hazardous chemicals begins, unless the risk is trivial. Assessments must consider primarily the requirements set out in the relevant sections of the COSHH, DSEAR and EPA regulations with an aim to-

- Adequately control exposure to materials that cause ill health.

- Control harm resulting from fire or explosion.
- Prevent or minimise pollution of the environment due to the release of chemicals.

The Queen Mary Hazardous Substances based risk assessment template should be utilised to ensure assessment details are not missed. Additional specialist risk assessments should be employed where required e.g., use of radioactive materials.

The COSHH Regulations require that exposure to hazardous chemicals must be prevented if this is reasonably practicable. If it is not reasonably practicable to prevent exposure, the hazardous chemical used should be the least harmful that the nature of the activity will permit (for example in teaching and some types of research).

If reasonably foreseeable risk of negative health affects remain after controls are in place, health surveillance or monitoring may be required. Such higher risk experiments will have to be justified and should be authorised by the Head of School/Directorate.

The risk assessment should be periodically reviewed (formally at least once every 3 years if residual risk is low, and annually if residual risk is higher) and updated as necessary over the active life of the project as per Queen Mary Policy.

Risk assessments must be stored electronically (in the MySafety system) where they may be viewed by staff with responsibility for safety in that area.

8.2 Dangerous Substances and Explosive Atmospheres Regulation (DSEAR)

Where the chances of a fire starting or an explosive atmosphere forming are foreseeable and the consequences non-trivial, the hazardous substances risk assessment must fully evaluate the risk.

The assessment will consider the quantity of material, its flammability (flash point, lower explosive limit) the potential range of conditions (temperature, humidity), the environment (volume of area, ventilation rate) and potential modes of failure.

If necessary, the assessment will assign a DSEAR zone according to the likelihood of the explosive atmosphere occurring and its expected frequency. (see HSG71- Chemical Warehousing for more guidance)

Where a zone has been assigned and its likely extent delineated, controls must address prevention of the formation of an explosive atmosphere, e.g. LEV.

Preventing sources of ignition is a key control This can be achieved through managing the process and its surroundings or potentially using ATEX rated equipment, e.g. spark free fans and lights.

It is anticipated that in the university environment zoning will not normally proceed beyond zone 2, and this is likely to be relevant to bulk chemical storage areas (where a mixture of air and flammable substances in the form of gas, vapour or mist is not likely to occur in normal operation, but if it does occur, will persist for a short period only)

Where a significant risk of fire or explosion is identified there must be a consultation with the Chemical Safety Adviser and Fire Safety team prior to commencement of related work to ensure facilities and management arrangements are suitable.

8.3 Control Measures

All control measures must be periodically verified by a responsible, competent person. The frequency is dependent on potential harm should they fail, and the likelihood that it will fail. This should be specified within the risk assessment.

LEV must undergo Through Examination and Test (TE_{XT}) at least once every 14 months, this must be carried out by a competent contractor and records kept.

Gas detection systems (e.g. oxygen depletion monitors) must be maintained according to the manufacturer's instructions and a service agreement must be in place.

Where a gas detection system has failed, the lab space must not be used until remedial work is completed. Gas systems supplying the lab should be closed at source.

Where Pressure Releasing Valves (PRVs) are used to vent gas in the event of a pressure system failure, the gas must be routed to a safe place which cannot have any dangerous interactions with the surrounding area.

The risk to persons entering the space and the action they should take in an emergency should be communicated to all affected persons via a) induction and training b) risk assessments c) local rules d) signage.

8.4 Chemical handling equipment

All such equipment must be verified as suitable for the intended purpose before purchase and at the point of use. Compliance with relevant legal standards should be verified- this is of particular importance when obtaining equipment from outside the UK or EU. (Note - UK Competent Authority (UKCA) marking now applies in full to many products, with continuing recognition of EU standards until notified on GOV.UK).

The generic use of the equipment should be risk assessed (considering non-chemical hazards and their potential interaction with hazardous chemicals) and standard operating procedure written after commissioning. This information must be reviewed periodically and made available to all operators or affected person upon request.

Must be maintained according to manufacturer's instructions. Where the maintenance of safety critical features is required, formal records must be made of this.

Maintenance should be carried out by a competent person and records kept. Where local staff lack this competence, maintenance shall be carried out by a third party whose competence has been assessed as suitable.

8.5 Personal Protective Equipment

Must conform to relevant British Standards (may be noted as BS EN / ISO standards) and UKCA marking (or applicable continued EU standard CE marking until notified on GOV.UK).

Be provided free of charge by the S/I/D responsible for the task and/or space.

Must be identified as suitable for the intended task through the risk assessment process.

Consider the individual needs of the user.

Be maintained by the user or responsible person such that their protection is maintained.

Eye protection must be always worn in all Queen Mary Laboratory spaces unless a risk assessment makes an exception for that **entire** lab space.

Where a need for respiratory protective equipment has been identified in the risk assessment, its use must be preceded by training and face-fit testing (for tight fitting respiratory equipment) organised through the Queen Mary Occupational Health service.

Please refer to the [Queen Mary Personal Protective Equipment](#) Policy for more information and supporting procedures.

8.6 Emergency procedures

Where the risk profile of an area indicates that the standard Queen Mary fire evacuation and first aid procedures are not sufficient, a bespoke emergency procedure will be written for that area.

The complexity and level of detail of these procedures will scale with the residual hazard identified in the risk assessment process.

Emergency procedures must be circulated to all potentially affected parties as necessary, and when any changes are made this must be circulated and receipt recorded.

The risk profile of a space will determine the type of specialised emergency equipment that is required and its location. This includes, but is not limited to,

- Specialist first aid e.g. antidotes, medical oxygen
- Drench showers (where there is significant use of corrosives for example)
- Eye wash stations
- Chemical neutralisation solutions for the person e.g. Diphoterine
- Fire suppression systems
- Spill kits

Information on the correct use of such systems must be provided to all affected person, training records retained, and periodic refresher training organised.

All safety critical equipment must be regularly inspected and maintained.

Relevant hazard information must be made available to responding parties in the event of an emergency- e.g. Safety Data Sheets, inventory.

Lab managers shall collaborate with HSD and EAF to ensure that emergency information and maps detailing the nature of chemical hazards must be kept up to date such that it may be accessed at any time during an emergency (held within the Premises Information Box)

Where there is a risk of a hazardous chemical spill that cannot be safely dealt with by lab users that spill procedure must be regularly reviewed and its efficacy tested by lab managers, safety coordinators and HSD.

Periodic reminders and/or drills should take place to ensure all users of a space understand how to protect themselves and others.

Any use of emergency systems must be reported via the University incident reporting system.

8.7 Information, training, and supervision

All persons entering a space with significant use of hazardous chemicals should first receive an induction from a responsible person. Records of the induction should be kept.

Local rules must be in place for each space with routine use of hazardous chemicals based on the risk profile and typical activities that take place. The rules must be displayed prominently, circulated to affected parties.

Repeated failure to comply with the local rules must result in a formal sanction. Lab rules must be enforced by responsible persons, e.g. PIs, lab managers, safety coordinators and HSD.

Each space where there is routine use of hazardous chemicals should clearly indicate this with signs on every external door. The sign must describe the nature of the hazard within using warning signs complying to HSE Guidance document L64 "Safety signs and signals. The Health and Safety Regulations 1996". It must also have current contact details for the responsible persons. The [Queen Mary template](#) provided should be utilised.

Training needs of staff and students should be identified on their joining the university and commencing work/or study and reviewed as necessary.

Training records must be kept for all higher risk or complex activities such that it can be shown the person has received formal, written instruction of how to safely perform that activity. The expectation is that standard operating procedures are written and reviewed to assist with this process.

The appropriate level of supervision must be always maintained with reference to the persons level of experience and training. It is the responsibility of the line manager or PI to ensure this supervision takes place and review its suitability, although it may be delegated.

Staff providing instruction and training should be sufficiently skilled and competent to do so. The HSE defines competence as a suitable combination of training, skills, sector experience and knowledge of the working environment, the techniques, equipment, and substances used and the hazards they pose. The level of skill and competence required to instruct others must be proportionate to the risk of the activity.

8.8 Health surveillance

Where the activity involves chemicals which pose a chronic health risk and risk assessment has identified residual chance of exposure, health surveillance may be required. In the first instance it is expected that control measures used are sufficient to reliably prevent exposure and health surveillance should not be used unless unavoidable.

Consideration must be given to whether health surveillance can be used at all. There must be a viable method of testing for the chemical and/or its metabolites in the body and literature indicating what safe levels are. Preferably this would be through testing of breath or urine rather than blood tests which are considerably more invasive to the person.

Where this is not possible environmental monitoring can be used to ensure that the concentration of chemical in the air is at a level regarded as safe considering the workplace exposure limit.

Completion of the job hazard form for all staff and PGR recruitment, and requests for health assessment and surveillance must be sent to the [Queen Mary Occupational Health](#) service, as per process on the [health surveillance and monitoring](#) webpage. Where health surveillance is identified for the individual, a health exposure record should be maintained by the individual as identified in [health surveillance and monitoring](#).

More detail on specific chemical hazard health surveillance and monitoring can be found within the Occupation Health policy – Appendix 1 in link above

8.9 Carcinogens, Mutagens Teratogens, and substances toxic to reproduction

Any substance to which the following apply-

- Category 1A, 1B carcinogen under Classification, Labelling and Packaging of Substances and Mixtures (EC) No 1272/2008 (CLP/GHS).
- Listed in Schedule 1 COSHH regulations 2002
- Category 1A, 1B or 2 Mutagen (as classified under CLP/GHS)
- Listed under Schedule III of Directive 2004/37/EC of the European Parliament and of the Council

Use of such chemicals must be only after robust justification. Where safer alternatives are available, they must be used.

A record must be kept of the following for up to 40 years in each case, please see the health exposure record template on the [health surveillance and monitoring](#) webpage.

- The name of the carcinogen/mutagen used.
- Title of the procedure or project.
- Name of the PI/Responsible person
- Authorised users
- Dates that users started and finished work with the substance.

Where there is reason to believe that uncontrolled exposure has occurred (as a result of an accident, monitoring of control measures or health surveillance) the risk assessment and method must be kept along with this information.

Quantities purchased and used must be as low as possible.

Exposure must be kept as far below the workplace exposure limit as possible.

Arrangements for use, storage, transport etc must be designed to limit the chances of exposure to other persons as far as possible, e.g. dedicated workspaces.

Control measure testing (e.g. LEV) frequency should be increased and records kept.

Any failure of control measures must be reported on the University reporting system.

Workplace monitoring must be considered.

All affected person must fully understand the risks to their health.

Health assessment and surveillance and/or monitoring must be put in place where control measures are not sufficiently reliable, e.g. relying on respiratory protective equipment and working with formaldehyde.

Young persons and New and Expectant Mothers must not work with CMRs or anywhere where potential exposure may take place.

Persons who become pregnant whilst potentially exposed to CMRs must notify their line manager or PI as soon as possible, the pregnancy risk assessment should be completed, and where identified in the procedure that a higher hazard level to the pregnant worker and/or unborn child / new born child may exist, it is notified to the [Queen Mary Occupational Health Service](#).

8.10 Young Persons

There are specific provisions in the Management of Health and Safety at Work Regulations 1999 to prevent the harmful exposure of persons under the age of 18 to any hazardous chemical which is toxic or carcinogenic, cause heritable genetic damage or harm to the unborn child or which in any other way chronically affect human health.

In reflection of this, any work that Young Persons carry out on Queen Mary premises using hazardous chemicals must be restricted to exclude any chemicals classified as above.

8.11 New and expectant mothers

The MHSW regulations stipulate that risk assessment must specifically consider the enhanced potential for harm that certain types of activities have on the health of an unborn or nursing child.

Any work with substances listed in Annex I or II of Council Directive 92/85/EEC requires a risk assessment to consider the potential for new and expectant mothers to be exposed.

When a person becomes aware that they are pregnant and are working with hazardous substances they should inform their line manager or PI to a) fully assess the risk to themselves and their child following the process and using the form on the [HR website](#) and b) make alternative arrangements for the necessary duration if necessary.

Where the ongoing potential for exposure to hazardous chemicals of specific concern has been identified, the expectation that such work will cease for the worker in question and alternative arrangements will be made that do not negatively affect their career and, or study for as long as necessary.

8.12 Sensitising agents

Any substance classified under the CLP regulations as:

- H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H317 May cause an allergic skin reaction.

Or any substance listed under the HSE list of skin irritants or respiratory sensitisers. (See Further information)

Where risk assessment identifies exposure is likely despite controls, or respiratory protective equipment is used as a control, health surveillance will be required.

See specific risk assessment form and process for [laboratory animal work](#).

8.13 Purchase of hazardous chemicals

All hazardous chemicals will be procured via University approved suppliers only. Each School/Directorate shall have a procedure to manage the authorisation, purchase, and receipt alongside associated record keeping.

Purchase of regulated chemicals must be with prior agreement of the person responsible for statutory declarations- typically the Chemical Safety Adviser.

Consideration of the necessary storage arrangements must take place before ordering.

Purchase must take place only after checking that this hazardous chemical is not already held and available for use within the School or Directorate.

Minimal quantities required must be ordered unless suitable storage arrangements are in place which minimise the associated risk e.g. secure external storage.

Delivery must be to a location with facilities and staffing suitable for the acceptance and storage of the hazardous chemical.

It is the responsibility of the person ordering the chemical to ensure that any relevant notifications are made and that the chemical inventory is updated.

Transfer of hazardous chemicals from another institution should be with written permission of the Head of School and carried out by a competent, licenced contractor.

8.14 Labelling

Chemical labelling must conform to Classification Labelling and Packaging (CLP) regulation (EC) No 1272/2008.

Labels must be clearly legible and replaced should any deterioration occur.

Containers should be marked with the date of receipt and the group who purchased them. Where applicable, the date of opening the container should be annotated.

Where a chemical of any type (e.g. samples whether hazardous or not) which is decanted into a new container (e.g. a vial) must be stored in such a way that the exact nature of the sample is clear, along with its owner and date. Code or shorthand is not acceptable. Use of secondary containers may be permitted to facilitate this.

8.15 Security

Access to areas where hazardous chemicals are used (including storage) must be limited strictly to authorised users. Authorisation is granted based on a) current, legitimate need for access b) sufficient training competence to safely work in the space.

Periodic review of user access should take place to ensure only the minimum number of people required may enter these spaces.

Regulated substances must be kept in a designated, locked cabinet of suitable construction. Access must be limited to the minimum number of responsible persons. Physical logs of access and usage must be maintained.

When not in use higher hazard chemicals (e.g. corrosive liquids, acute toxins, pyrophoric) should be kept in a secure location within the laboratory space and never on the open bench.

Any loss or theft of chemicals must be reported immediately.

8.16 Storage

Storage facilities must be assessed as suitable and safe for the intended use, e.g., provides suitable segregation of incompatible chemicals, adequately ventilated, adequately bunded suitable proximity to fire detection systems and fire-fighting equipment and with appropriate access restriction.

Hazardous chemicals must not be stored in corridors or within 3 metres of fire exits.

Quantities of flammables and oxidising agents must be kept to the minimum operational requirements due to the fire risk. This must not exceed 50 litres of highly flammable liquids within a laboratory space.

The use of fire rated cabinets may increase this volume, subject to risk assessment. Cabinets must conform to BS EN 14470-1:2004 'Fire safety storage cabinets – Part 1: Safety storage cabinets for flammable liquids'. The expectation is that all volumes over 5l will be stored in a fire rated cabinet and this requirement will be identified during inspections.

Any central (i.e. serving multiple laboratory spaces) chemical storage facility will be managed by specific named persons who have are competent to manage the risk profile of this facility.

The construction and operation of bulk flammable chemical stores will comply with the requirement set out in the HSE Guidance document HSG51- "Storage of flammable liquids in containers "

Storage facilities will display appropriate warning signage to indicate the nature of the hazardous chemicals within.

Arrangements must be put in place to manage the risk from hazardous chemicals which may deteriorate in storage such that their hazard classification changes, and risk profile increase beyond an acceptable level e.g. formation of touch sensitive explosives.

8.17 Record keeping

All Schools or Directorates who use hazardous chemicals must keep an up-to-date inventory.

The inventory must indicate the chemical name, CAS number, date of purchase, quantity, location, hazard classification, responsible person, and any other relevant information such as shelf life or incompatibilities.

Responsibility for maintaining the inventory must be assigned to and understood by relevant parties. Stock checks should take place periodically. Where records indicate chemicals have not been used for a period of three years or more, disposal should be considered.

Where unexplained losses of hazardous chemicals are discovered, this must be urgently reported as an incident.

When an academic or researcher leaves Queen Mary, transfer of chemicals will require permission from the Head of School and carried out by a licenced and competent contractor. Any material no longer required should be disposed of by the School, following [laboratory clearance process](#).

8.18 Transport

Transport within the demise of Queen Mary (i.e. between buildings on one campus) can take place subject to risk assessment and use of suitable equipment.

Transport of hazardous chemicals between Queen Mary campuses or to other institutions requires a prior consideration of the Carriage of Dangerous Goods and use of Transportable Pressure Equipment Regulations 2009- this should be carried out in conjunction with HSD unless a previous method has been established and validated.

Where the need to cross a public road (e.g. Bancroft Road) occurs CDG regulations DO apply unless an exemption has been granted.

The transfer of novel substances (e.g. currently unclassified under CLP) will place further obligations on the user including

- Compilation of relevant hazard information
- Evaluation of hazard information relating to the substance
- Review of information against CLP chemical hazard criteria
- Self-classification of any chemical hazards
- Notification to European Chemical Agency Classifications and Labelling Inventory.

Given the complexity of the regulations this will require consultation with a University approved Dangerous Goods Adviser, via the Chemical Safety Adviser.

Transfer of novel research chemicals to other organisations will likely require a Material Transfer Agreement to cover issues around liability and intellectual property. This can be organised via the Joint Research Management Office.

Export must follow the Queen Mary Export Controls and Sanctions Policy and the applicable local regulations on chemical safety.

8.19 Disposal

Each School/Directorate must have a written local procedure for the disposal of hazardous chemical waste that aligns to the [HSD procedure](#).

The school procedure will name designated person(s) who are responsible for a) ensuring information submitted is correct b) the waste storage facilities are kept in good order c) waste disposal occurs in a timely fashion to prevent accumulation of waste in working areas d) information is passed onto the Chemical Waste lead.

No hazardous chemical designated as waste will be kept on Queen Mary premises for more than one year.

All removal of hazardous chemical waste from Faculties will be overseen by the HSD Chemical Waste Lead. EAF and their subcontractors have a parallel process to deal with products used by maintenance and projects.

All relevant records will be maintained in an accessible format and retained for a period of at least 3 years. Derived statistics will be submitted to HESA, the sustainability team and other interested parties as required.

Prior to selection of a hazardous chemical waste disposal contractor, due diligence will be carried out to ensure that Queen Mary meets its statutory obligations.

Equipment disposal will be organised via Estates and Facilities however where relevant a decontamination certificate will need to be filled out by the user.

8.20 Regulated substances.

8.20.1 There are specific legal obligations on certain substances.

Persons intending to use these substances must, prior to purchase, ensure they are familiar with the relevant legislation and guidance and are able to implement the operational requirements they stipulate.

There may be a requirement for a licence and auditing by the enforcing body. Any such application must be verified by the Health and Safety Directorate.

In all cases there is a need for the substances to be stored securely- within a dedicated locked cabinet and keys available only from nominated responsible persons.

Records of use must be kept demonstrating compliance, assist with auditing and annual declarations should these be required.

Annual declarations or changes in use must be made to the relevant body, either via or with reference to the Chemical Safety Adviser.

Once the substance is no longer required it should be disposed of. This may require notification to the regulating body, a specialist contractor, or an independent witness to the disposal process.

Local processes must be written to meet the requirements of the use of these substances and ensure that management arrangements are understood by all affected persons.

8.20.2 Controlled drugs

Any substance listed in Schedule 2 of the Misuse of Drugs Act 1971 and in Schedules 1 to 5 of the Misuse of Drugs Regulations 2001.

8.20.3 Controlled drug precursors

Chemicals which have historically been used in the illicit manufacture of controlled drugs. The regulations (EC Regulation No 273/2004 Governing procurement and supply of drug precursors) ask users of aid substances to declare their holdings annually.

8.20.4 Chemical Weapons Precursors

Chemicals listed under Schedule 2 or 3 of the Chemical Weapons Convention, an International treaty.

Schedule 3 chemicals are the most commonly encountered within the University environment. They have legitimate uses but are either highly toxic or an essential precursor to more stringently controlled substances.

8.20.5 Explosives

Under the Explosives Regulations 2014, explosive means:

(a) any explosive article or explosive substance which would -

- if packaged for transport, be classified in accordance with the United Nations Recommendations as falling within Class 1; or
- be classified in accordance with the United Nations Recommendations as being unduly sensitive or so reactive as to be subject to spontaneous reaction and accordingly too dangerous to transport, and falling within Class 1; or

(b) a desensitised explosive (i.e., a solid or liquid explosive that is wetted or dissolved to suppress its explosive properties, and which would be a Class 1 substance without that treatment).

8.20.6 Explosives precursors

Chemicals which are listed under the Control of Poisons and Explosives Precursors Regulations 2023.

8.20.7 Poisons

Substances specified within Schedule 1 of the Poisons Act 1972.

8.20.8 Anti-terrorism, Crime and Security Act 2001

Schedule 5 lists several highly potent toxins. Their purchase and use have stringent regulatory requirements and will require prior approval from the Home Office and specific security infrastructure and procedures would apply.

8.20.9 Ozone Depleting Substances

Halogenated hydrocarbons which when released into the environment have the ability to cause depletion of the ozone layer. Usage is heavily regulated although there are exemptions for research a declaration of use must still be made annually.

9.0 Further Information

9.1 Guidance documents-

There is useful guidance available on all of these topics available on the [HSD Connected](#) site. This will include, where relevant, policies, forms, and guidance documents.

10.0 Appendices

10.1 Chemical safety

[Working with substances hazardous to health](#): A brief guide to COSHH

10.2 LEV

[Clearing the air](#)- A simple guide to buying and using local exhaust ventilation (LEV)

[Controlling airborne contaminants at work: A guide to local exhaust ventilation \(LEV\)](#)- a detailed guide explaining the concepts behind LEV and the duties placed on users, owners, and maintenance engineers.

10.3 Flammable chemical storage and management

[Chemical warehousing: The storage of packaged dangerous substances](#)- HSE guidance document. Whilst aimed at industrial sites has useful guidance on the design of flammable liquid and gas stores and controls to prevent and mitigate against fire and explosion.

[Storage of flammable liquids in containers](#)- HSE guidance document. Helpful practical guidance on external flammable storage of liquids.

[ATEX and explosive atmospheres](#)- HSE guidance on managing the risks from explosive atmospheres. ATEX is a European Council directive relating to minimum requirements for managing and the applicable standards for equipment used in Explosive Atmospheres

[British standard for flammable cabinets for liquids](#)

[British standard for flammable cabinets for compressed gas](#)

Note - Many standards may be accessed at the [Queen Mary Library BSOL portal](#) by staff and students.



10.4 Health surveillance

[Biological monitoring in the workplace](#)- A guide to its practical application to chemical exposure- current HSE guidance giving practical advice on monitoring programmes.

[EH40/2005 Workplace exposure limits](#)- list of current workplace exposure limits approved by the HSE- updated in 2020.

[Higher Education Occupational Practitioners](#) - website containing guidance on occupational hazards in research.

Document Control

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