Risk Management Guidelines - Chemical

Introduction

These guidelines are designed to assist users when assessing risks and determining appropriate control measures associated with chemical hazards. These guidelines must be read in conjunction with the OHS Risk Management Procedure.

All risk assessments must be documented using the online system - SARAH.

When to do a chemical risk assessment at Monash

A risk assessment must be undertaken for all activities that involve chemical hazards as described in the Using Chemicals Procedure.

How to do a risk assessment at Monash

Tutorial videos on how to use SARAH to complete risk assessments, are available on the Risk Management and Safe Work Instructions page.

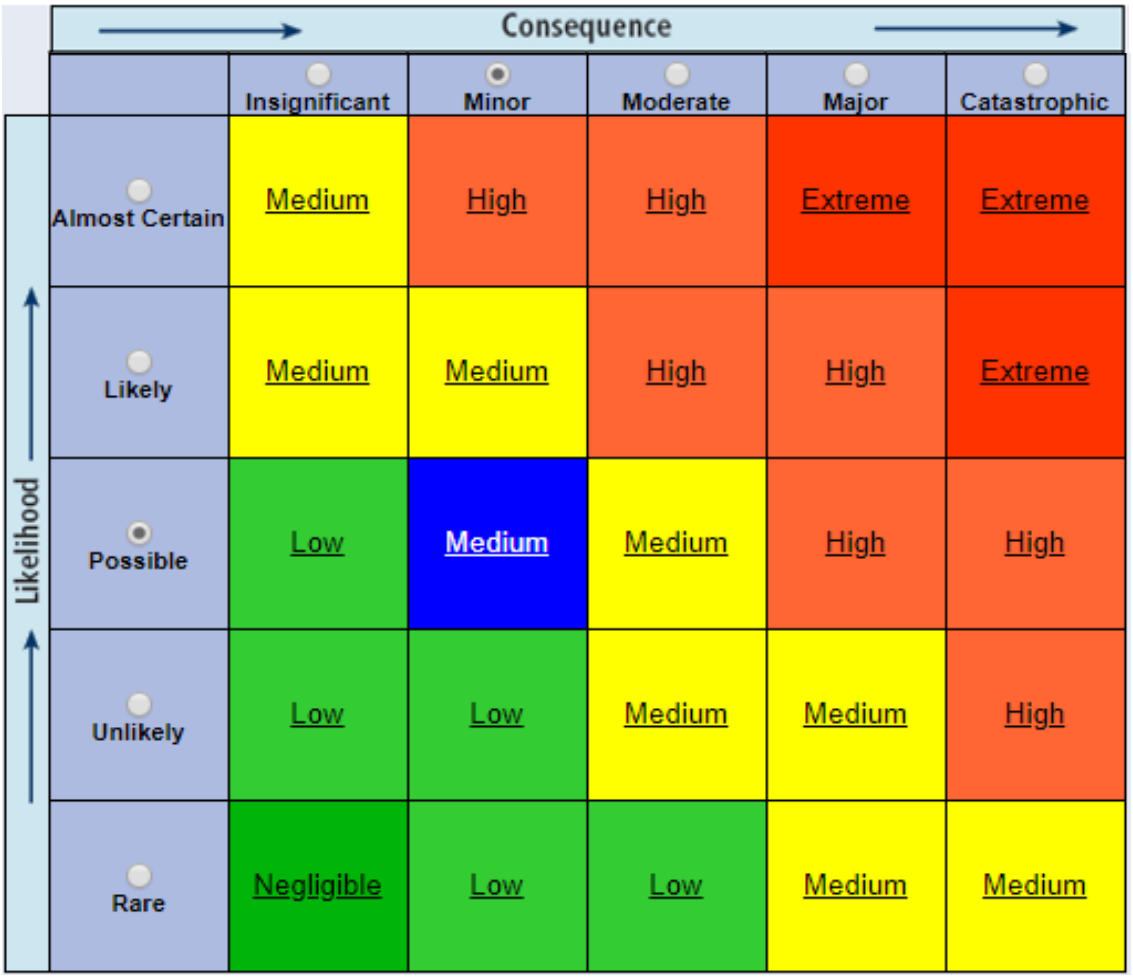
If the activity being assessed is common at Monash University, there may be an existing risk assessment available in SARAH, which could be adopted using the cloning function.

To undertake a risk assessment:

1. Follow the OHS Risk Assessment Guide to complete the risk assessment form in SARAH.
2. Describe the activity that is being assessed involving the use of chemicals. Refer to any existing Standard Operating Procedures (SOPs) or protocols relevant to the activity.
3. Determine who are the people who know about the process and the hazards associated with the activity (e.g. Supervisors, Safety Officers, Subject Matter Experts, OHS Consultant/Advisor).
4. Identify chemicals that will be used and consult the most current vendor SDS in Chemwatch.
5. Select the most appropriate Mechanism of Injury and the Agency of Injury associated with the risk factor being assessed.
6. Describe how the risks associated with the Mechanism and Agency can lead to injury or disease in the context of the activity that is being assessed.
7. In relation to the chemical, take into account:
    a. Physiochemical hazards of the chemicals and their classification (e.g. Hazardous Chemical and/or Dangerous Goods);
    b. Operating temperature;
    c. Volatility or dustiness;
    d. Amounts that will be used;
    e. Frequency of use;
    f. Any possible new or unknown substances that may be generated in the course of the activity;
    g. Any potential hazardous conditions that may be generated (e.g. high pressure, vacuum)
    h. Potential routes of exposure;
    i. Equipment that will be used in conjunction with the chemicals;

j. Waste generation and disposal process;
k. Transporting of chemicals and/or chemical waste between labs and/or sites;
l. Decommissioning and disposal of equipment or materials contaminated with chemical residue;
m. Other hazardous tasks or activities that may need to occur as part of the process (e.g. operating equipment, handling biological materials).

8. Identify:
    a. Storage and handling requirements including any incompatibility considerations;
    b. Any relevant Health Surveillance requirements based on the Health Surveillance procedure;
    c. Specific First Aid requirements as set out in the First Aid Procedure;
    d. Emergency response and spill containment requirements;
    e. Occupational exposure limits;
    f. Specific PPE requirements, including a need for respiratory protection where appropriate.
9. Consult with your risk assessment team on the risk factors identified.
10. Examples of available resources include:
    a. Monash University OH&S Chemical Management webpage;
    b. Australian Standards (e.g. AS/NZS 2243.2:2006 Safety in laboratories Part 2: Chemical aspects, AS/NZS 2243.10:2006 Safety in laboratories Part 10: Storage of chemicals);
    c. Worksafe Code of practice: The storage and handling of dangerous goods;
    d. Worksafe Compliance code: Hazardous substances;
11. Identify and describe the existing controls currently in place. Refer to **Table 2** for common examples.
12. Identify the Hazard statements associated with the chemical listed in Section 2 of the SDS.
13. Determine the hazard level associated with the chemical using the Chemwatch Hazard Rating. The Chemwatch Hazard Rating is indicated in the **Gold SDS**.
14. From the Risk Matrix in SARAH, select the *Consequence* option with consideration given to the existing controls. Refer to **Table 1** for consequence descriptors.
15. For calculating the *Likelihood* associated for **inhalation** hazards, determine the volatility or dustiness of the chemical and the boiling point of the chemical using **Diagram 1**. This information can be found on the SDS for the chemical.
16. For calculating the *Likelihood* associated with **other** hazards, consider such variables as frequency and duration of the activity with the existing controls in place.The risk rating will be assigned automatically once the *Likelihood* and the *Consequence* are selected. Refer to the Risk Matrix below.



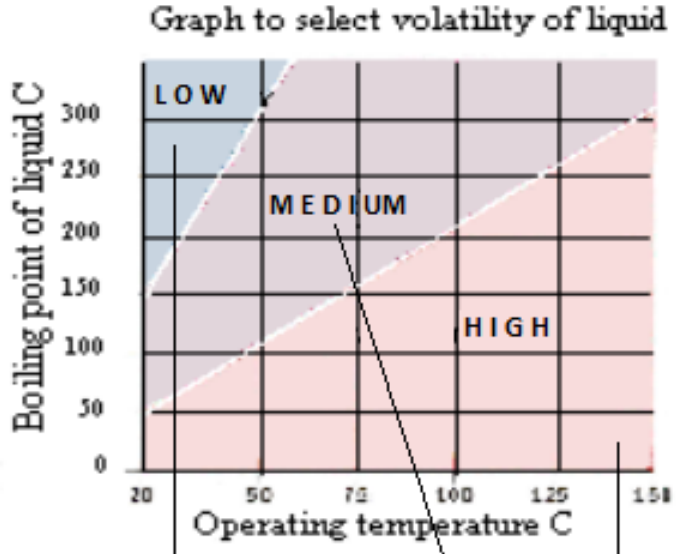
17. Determine if additional controls are required that could further reduce the risk level. Refer to **Table 2**.
18. Nominate a person responsible and the due date to implement each control.
19. Re-assess the residual risk level with the proposed controls implemented.

Table 1: Chemwatch Hazard Ratings

Hazard Rating	Gold SDS Colour Code	Icon	Nature of Hazard	Corresponding Consequence in SARAH
0/Min	Grey		Non Hazardous Chemical	Insignificant
1	Blue		Low Hazardous Chemical	Minor
2	Yellow		Moderate Hazardous Chemical	Moderate
3	Orange		Highly Hazardous Chemical	Major
4	Red		Extremely Hazardous Chemical	Catastrophic
N/A	N/A		Classification not provided by Chemwatch	

Diagram 1: Inhalation Hazards Likelihood Matrix

	Dust or Aerosol potential			
	Low	Medium		High
Properties	Block and pellet like solids that remain intact.	Crystalline, granular or flakey solids. Dust visible but settles out quickly. Dust remains on surfaces.		Fine, light powders. Dust clouds can be seen. Remains in air for several minutes.
Examples	PVC pellets, waxed flakes, prills, solids in H_2O or under oil	Soap Powder		Cement, carbon black, chalk dust
Particle size	> 200 micron	10 - 200 micron		< 10 micron



Amount	Dust or Aerosol potential & Volatility			
	Low Dust or Aerosol potential & Volatility	Medium Dust or Aerosol potential	Medium Volatility	High Dust or Aerosol potential & Volatility
High (tonne or m^3)	Possible	Likely	Likely	Almost Certain
Medium (kg or litre)	Possible	Possible	Likely	Likely
Small (g or ml)	Unlikely	Unlikely	Possible	Possible
Very Small (mg or µl)	Rare	Rare	Unlikely	Unlikely
Micro (<µg or <µl)	Rare	Rare	Rare	Unlikely

Table 2:

Chemical Hazards Hierarchy of Controls	
Elimination	Use a physical process instead of a chemical process. E.g. use ultrasound to clean equipment instead of cleaning chemicals.
Substitution	Use a safer chemical e.g. detergent instead of chlorinated solvent for cleaning; use water-based paint instead of solvent-based.
	Use a safer form of the chemical. E.g. Buy pellets of NaOH vs liquid, use commercial kits for nucleic acid extraction vs phenol extraction; buy smaller containers.
Isolation	Separate workers from the chemical by distance or barrier, e.g. use closed system such as a glove box; isolate a process to a room with restricted access; separate incompatible chemicals and ignition sources.
Engineering	Controlled ventilation e.g. natural or mechanical where air is removed by a powered fan.
	Install air monitoring systems.
	Use automation to perform activities involving chemicals.
	Use fume cupboard.
	Store Dangerous Goods in safe storage cabinets
	Place lids on containers immediately after use
	Use bunding to capture spill
	Install fire protection systems
Administrative	Reduce the number of workers exposed, reduce the duration and/or frequency of exposure; reduce the quantity of chemicals stored and used.
	Ensure all staff are provided with information training and instructions regarding the hazards associated with the chemicals in use.
	Ensure those using substances have completed Dangerous Goods & Hazardous Substances training.
	Ensure good housekeeping standards are practiced at all times.
	Ensure all containers are labelled correctly.
	Consult the Safety Data sheet (SDS) before commencing work.
	Store chemicals in accordance with the Monash Chemical Storage Guidelines and ensure spill kits are suitable for the type and quantity of substances in use.
	Ensure Safe Operating Procedures/Safe Work Instructions are developed.
	Dispose of all wastes as per the SDS and Chemical waste disposal guidelines.
	Provide suitable First Aid facilities
	Provide emergency eye wash stations and safety showers.
	Review work practices: e.g. Consider whether after hours work will be required as per the After Hours procedure.
	Ensure all requirements for licenses, permits or notification to use the chemical are met e.g. When working with Scheduled Carcinogens and Scheduled Drugs and Poisons.
	Display mandatory PPE signage at the entrances to laboratories and workshops.

Personal Protective Equipment (PPE)	PPE must be compatible with chemical(s) being used/stored and where applicable meet the relevant Australian Standard. PPE examples include: • chemical resistant safety glasses • face shields; • Fit tested masks/respirators – full face or half-face • Lab gowns, overalls, aprons; • gloves; • enclosed shoes, safety boots.