SCHOOL OF EARTH SCIENCES

Environment Health & Safety Manual

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EMERGENCY INFORMATION -
Important Telephone Numbers

Emergency Assistance (24 Hours)

Ambulance	0-000
Fire Brigade	0-000
Police	0-000
Security Office (cnr Monash Rd & Swanston St)	46666
Poisons Information Centre	0 131 126

Property & Campus Services (PCS, formerly known as P&B)

Building Defects, air conditioning, lights, other maintenance issues	46000

OHS and Injury Management (formerly RMO or EHS Unit)

General Enquiries	43050
University Radiation Protection Officer (Steve Guggenheimer)	43052
	0411 111 265
John Carmichael (EHS adviser)	49249
	0414 878 428
Sam Montalto, EHS manager, Faculty of Science	46924
	0425 800 085

Medical Services

University Health Service (GP services for students and staff) 138-146 Cardigan St, Carlton	46904
Royal Melbourne Hospital Emergency Grattan St, near corner with Royal Parade, Parkville	0-9342 7000
Eye & Ear Hospital Accident & Emergency 32 Gisborne Road, East Melbourne	0-9929 8666

School of Earth Sciences EHS Committee membership

Chair	Dr Roland Maas	Rm 326	Ext. 46522
School Manager	Richard Young	Rm 411b	Ext. 49867
Professional Staff Rep.	Helen Russell	Rm 401	Ext. 49788
Academic Staff Rep.	Dr Jon Woodhead	Rm 326	Ext. 48621
Health and Safety Rep.	Vacant		
2nd Academic Staff Rep	Dr Frank Drost	Rm 454	Ext. 47304
Student Rep.	Peter Hoiles	Rm 312	Ext. 47673
Field Rep.	Dr. Sandra McLaren	Rm 345	Ext. 47215

School of Earth Sciences EHS officers

School OHS Officer	Dr Roland Maas	Rm 326	Ext. 46522
School Radiation Safety Officer	Dr Roland Maas	Rm 326	Ext. 46522
Noble Gas Group Radiation Safety Officer	Dr Mark Kendrick	Rm 417	Ext. 46933

First Aiders

The following staff and students have received first aid training (Workplace Level 2, or equivalent) as issued by a recognised authority such as St Johns Ambulance or Australian Red Cross. Due date for reclassification in brackets

Level 1

Level 2

Matt Cupper (until 10/2012)	Rm.212	Ext. 46521

Level 3

Stephen Gallagher (until 10/2012)	Rm 340	Ext. 46513
Malcolm Wallace (until 10/2012)	Rm 337	Ext. 46526
Sandra McLaren (until 10/2012)	Rm 345	Ext. 47215
Roland Maas (until 10/2012)	Rm 326	Ext. 46522
John Moreau (until 5/2012)	Rm 339	Ext. 46518

Level 4

Ian Simmonds (until 11/2012)	Rm 444	Ext. 47216

First Aid Kits

The School currently maintains 17 First Aid kits distributed around the building. Below is a list of current locations. The kits are white and bear a green (St John's) cross on the front (except in Rm 332 where first aid supplies are kept in a black plastic box).

Most kits are for use in laboratories and are not available for general use (labs usually locked).

First Aid kits for general access are kept in Front Office (Rm 401) and in the photocopy/printer/mail room (Rm 408); the latter is never locked. Undergraduate students have access to a first aid kit in the Skeats Teaching Laboratory (Rm 209).

Each kit contains a list of emergency contacts and a brief synopsis of First Aid principles. This does not replace proper knowledge of first aid which can only be gained through appropriate training. Current First Aiders are listed on page 6 of this manual.

Level 1	
Thin Section Laboratory	Rm 106
Cold Room Laboratory	Rm 113b
SEM/Electron Microprobe	Rm.129
XRF Laboratory	Rm.127
Rock Crushing Laboratory	Rm 139
Level 2	
Skeats Teaching Laboratory (break glass for key)	Rm 209
Mineral Separation Laboratory	Rm 221
Level 3	
Palaeontology Laboratory	Rm 318
Sedimentology Laboratory	Rm 320
ICP-MS Laboratory	Rm 336
Radiogenic Isotope Clean Lab	Rm 332
Level 4	
Front Office	Rm 401
Noble Gas Laboratory	Rm 402
Photocopy/Printer/Mail Room	Rm 408
Fission Track Laboratory	Rm 424
Hydrogeochemistry Laboratory	Rm 445
Cosmogenic Laboratory	Rm 451
Level 5:	
Meteorology/Synoptic Laboratory	Rm 501

Maintenance of first aid kits
First Aid kits are checked and restocked on a 3-monthly basis; more frequent restocks can be arranged. In 2011, the restocking is done by Roland Maas, x 46522. Each kit contains a list showing the dates of inspection and restocking. A supply of First Aid kit restock items is kept in rm 326. New supplies are obtained occasionally from local supermarkets and pharmacies, or from St John's Ambulance.

Field trip kits
The School has three special first aid kits which are used for field work. These kits, housed in very sturdy orange-coloured plastic cases, are more comprehensive than the ordinary kits. When not in use, they are kept in the small store room with blue door, opposite rm 401. Staff/students wishing to take out a Field First Aid kit must check with Front Office staff who maintain a booking system for these kits. Field First Aid kits must be signed out before they are taken, and signed back in on return to the Front Office. **Users must ensure they book their kit(s) early, liaise with others who wish to use them, and pick up their kits on the last business day before leaving for the field**. On return, hand back kit at earliest opportunity. If contents have been seriously depleted, inform Front Office staff to ensure timely restocking. In 2011, field kits are maintained by Roland Maas (x46522)

EMERGENCY INFORMATION - Building Evacuation

Procedures

Every staff, student and registered visitor to the School of Earth Sciences building must be aware of the procedures for an emergency building evacuation. Information about building evacuation forms part of your induction which you must complete before you can take possession of keys to an office or other room within the McCoy Building.

Building evacuations may be necessary for a range of reasons, including fire, flooding, chemical spill, gas leak, and other threats. Once a year, an unannounced evacuation drill is held during business hours.

All evacuation alarms are to be treated as serious; never assume the alarm is a drill.

The building emergency evacuation alarm is a continuous loud ring – like a school bell. It is very distinct from the theft alert in the PC lab on level 3 which is a much weaker pulsing sound.

On hearing the building alarm, evacuate the building by the shortest route and proceed to the Assembly Area, see below. Everybody must evacuate the building. Evacuation may be through either the staircase on the west side (main staircase, leads to foyer and ramp), or via the eastern staircase, exiting via the backdoor. All doors can be opened from the inside at all times.

Lifts are not to be used during evacuations – if there is a fire, the lift is a very dangerous place.

During a building evacuation, the designated floor wardens (with their yellow hard hats) check each room to ensure nobody remains in the building. Follow their directions. When outside the McCoy building, move well away from the building. Do not crowd around doorways.

Assembly Area

Once outside the building, move to the assembly area around the corner in Cardigan Street, outside the beer garden of the Clyde Hotel. Do not block access for emergency services.

Do not re-enter the building when the alarm stops. The signal to re-enter the building will be given by the Building Emergency Coordinator (Richard Young), his deputy or the Fire Brigade Officer in charge.

People with limited mobility

Building 200 is poorly designed for people with limited mobility. Ramps are restricted to the broad ramp leading from Elgin St to level 2, and to a narrow ramp in the carport, leading to level 1. Vertical movement within the building is only via stairs and the lift. There is no fire-rate stairwell. Because lifts cannot be used during an emergency, people with limited mobility will have to move/be moved via the stairs, i.e. will require assistance.

Floor wardens

Emergency information posters with photographs of Wardens for that area are displayed on each floor.

Level 1

Warden	vacant	
Deputy	vacant	

*during an evacuation alarm, level 1 will be checked by wardens from levels 2 and 3

Level 2

Warden	Sandra McLaren	Rm 345, Ext. 47215
Deputy	Barbara Wagstaff	Rm, 217,Ext. 46537

Level 3

Warden	Roland Maas	Rm 326, Ext. 46522
Deputy	Alan Greig	Rm 326, Ext. 47618

Level 4

Warden	David Phillips	Rm 419, Ext. 46524
Deputy	Frank Drost	Rm.454, Ext. 47304

Level 5

Warden	Ian Simmonds	Rm 444, Ext. 47216
Deputy		

Building Emergency Controller

BEC	Richard Young	Rm 411b, Ext. 49867
Deputy	Helen Russell	Rm 401, Ext. 49788

Duties

Floor Wardens

Observe on a daily basis all passageways, stairs and emergency exits to ensure that these remain unobstructed.

Regularly advise the Building Emergency Controller on:
- Special hazards in area.
- Changes in permanent staff or student numbers.
- Any potentially hazardous situation observed or reported by personnel in their area.
- Ensure checking of fire extinguishers and replenishment after use.

EMERGENCY ACTION

Raise the alarm (activate break glass alarm if required) or upon instruction to evacuate.

Rescue any person in immediate danger.

Commence evacuation ensuring -
- movement in passageways and on stairways is orderly
- all rooms, including toilets, are checked for remaining personnel.
- close doors to minimise spread of smoke and fire.
- arrange first aid assistance as required at the appropriate time.

After all personnel are evacuated to the assembly area, the wardens should report the status of the evacuation to the BEC at the fire panel (Second floor foyer).

Once people have been safely evacuated, assess if there are measures that can be taken to reduce the possibility of environmental damage.

Building Emergency Controller, BEC

Ensures installation of fire fighting equipment, extinguishers, etc.

Floor Wardens ensure that aisles, stairways and fire exits are kept free from obstruction.

Maintain up-to-date lists of potentially dangerous chemicals and equipment (with assistance from work area supervisors).

Investigate any situation reported by Floor Wardens or others to assess the need for evacuation.

EMERGENCY ACTION

In the event of fire or other emergency requiring building evacuation, proceed to the fire panel and maintain control over the evacuation proceedings until relieved by attending senior public authority officer.

Check the fire indicator panel. If no alarm is indicated activate break glass alarm.

Maintain communications with floor wardens throughout emergency, co-ordinating activities and requests for additional assistance.

Direct floor wardens to block building access from:
- Main loading bay door
- Carpark/ITS walkway

Confirm with Security (Ext. 46666) that Fire Brigade has been alerted.

Confirm that Maintenance response team has been contacted (Ext 46000).

Contact and give progress reports to University Emergency Controller if serious personal or property damage occurs.

Complete evacuation checklist and forward to OHS & Injury Management Dept.

EMERGENCY INFORMATION - Chemical Spills

Chemical spills should not be left unattended. Proper treatment of chemical spills is important to prevent injury to people and damage to the environment. While risks to people should be assessed first, it is important to attempt to minimise environmental impact (chemicals down drains, into air-conditioning systems etc.)

If spill occurs in a laboratory, follow emergency procedures outlined in local laboratory manual and/or inform lab manager. Each laboratory has spill kits to neutralise and absorb spills.

If spill occurs in a room other than a lab, proceed as follows:

- ensure nobody walks into affected area (lock room, communication)

- assess nature and extent of spill and inform school management (Front Office is a good first option)

- if it is safe to do so, use spill kit to neutralise/absorb spill

A general access spill kit (vermiculite absorber) is available in Front Office (Rm 401, behind door).

If the spill is large and/or dangerous evacuate the area and set off the break-glass alarms.

Spill Kits

A Spill Kit consists of two buckets, one containing sodium bicarbonate ("bicarb" or "baking soda") to neutralise acid, the other containing vermiculite. Vermiculite is an absorber used to soak up liquids (will work on water-based reagents and organic solvents). Note that vermiculite will only absorb the liquid, it will not eliminate it. Acid spills should therefore be neutralised with sodium bicarbonate before applying vermiculite. If it is safe to do so (e.g. toxic fumes may still present a hazard), collect the spent vermiculite in a sturdy plastic bag (best to double-bag, use small shovel and plastic gloves) and label for disposal.. Consult work area supervisor, an EHS Committee member, or the school manager before disposing of large amounts of contaminated vermiculite. In some cases, this may have to be stored until hazwaste disposal can be arranged.

Release of Noxious / Toxic Substances into Atmosphere

If noxious / toxic substances are accidentally released into the atmosphere, the building should be evacuated by activating the break-glass alarm. Provide information on the incident to the Laboratory Manager, BEC or Fire Brigade.

EMERGENCY INFORMATION - Accident/Incident Reporting

Every incident that causes injury, has the potential to cause serious injury, or has a real or potential environmental impact, must be reported. Examples of incidents are fire, flood, explosion, release of toxic chemicals into the atmosphere, personal injury, cases of sudden illness and near-misses. Incidents that occur during fieldwork and other work-related off-campus activity also need to be reported. If unsure, ask the School Manager or a member of school EHS Committee.
Incident reporting is important for a number of reasons: it is a legal requirement (WorkSafe); it may help eliminate further, potentially more serious incidents of the same type; it may help identify and eliminate previously unrecognised hazards. Failure to report an incident or illness could expose others to injury and may adversely affect future insurance claims.

Our aim is zero incidents.

How to report an incident

The type of EHS incidents to report include:
- Injuries or illnesses
- Incidents or near misses
- Property loss or damage
- Environmental damage
- Theft

Incidents and/or hazards must be reported without delay to a supervisor, such as your lecturer or, in the case of staff, your assigned staff supervisor, or a work area supervisor. For incidents that occur off-campus, contact the School or a senior staff member of the school immediately. If possible, do not disturb the incident site to allow proper investigation.

All incidents should also be reported directly to the Earth Sciences School Manager (Richard Young) or a member of the school EHS Committee (see page 5 of this manual or EHS Noticeboard in staff room for names). If unsure, ask at Front Office.

Once an incident has been reported verbally (to supervisor, School manager, EHS Committee), the person involved, or the staff member to whom the incident was first reported, is required to produce a written report of the incident:

-via Themis EHS Incident Reporting, for those who have access to Themis; or

-on a hard-copy S3 Incident Report form available online at http://safety.unimelb.edu.au/docs/Incident_Report_S3.pdf <http://safety.unimelb.edu.au/docs/Incident_Report_S3.pdf> (use this only if you do not have access to Themis)

The School manager or a member of the EHS Committee will be able to assist with the report. If a hard-copy S3 Incident Report has been produced, it needs to be submitted to Earth Sciences School Manager (R Young) or to a member of EHS Committee for entering into Themis.

What happens with these reports ? Once a report has been entered into Themis, it is sent to the reporter's supervisor who is then expected to do the following (for further advise, see websites at bottom of page)

-acknowledge the incident report in Themis

-ensure that corrective actions are implemented

-ensure that local personnel are consulted about the corrective actions

-monitor the success or otherwise of the corrective actions

In Earth Sciences, as in other departments, School management and EHS Committee should be involved in the handling of incidents from the start because it is usually the manager and the school safety officer, in conjunction with supervisors, who investigate incidents and implement/monitor corrective actions.

If the incident risk rating is medium, high or very high, a formal incident investigation must be completed by a team comprising the person/s involved in the incident, the supervisor, School Manager and School Safety Officer. The result will be a set of corrective actions and a plan to implement and monitor these measures. A report on the incident and the proposed control measures will be made at the next School EHSC meeting. EHSC monitors implementation of the proposed control measures and reports to EHS Manager (Faculty of Science) as required, following the prescribed path for incident investigation close-out (websites see below). The S4 Incident Investigation form has been developed to assist those undertaking incident investigations. The completed S4 Incident Report form should be attached electronically to the incident report in Themis. The S4 Incident Investigation form is available online at http://safety.unimelb.edu.au/docs/Incident_Investigation_S4.pdf <http://safety.unimelb.edu.au/docs/Incident_Investigation_S4.pdf>

The School EHS Committee is required to review incident investigation reports submitted by Incident Investigation Team Leaders. The EHS Committee is required to nominate a person to review and report back to the committee on the effectiveness of the implemented control measures.

Every effort should be made to report incidents as quickly as possible. If an incident is particularly serious (i.e. a *high consequence incident* resulting in serious injury or death, or exposes a person to immediate risk to health or safety), School management must contact the on-call EHS Adviser through the Parkville Campus Security Control room on 03 8344 6666 or extension 46666. The on-call EHS Adviser shall assess the incident details and determine if the incident requires notification to WorkSafe Victoria and, if necessary, complete the notification. For more information about high consequence incidents, refer to *Safety Bulletin 01-07: Serious Injury and Incident Notification* at http://safety.unimelb.edu.au/docs/Safety_Bulletin_01_07_Serious_Incident.pdf <http://safety.unimelb.edu.au/docs/Safety_Bulletin_01_07_Serious_Incident.pdf> .

Documents and Help

EHS incident report and investigation forms, as well as help with Themis EHS Incident Reporting, are available from: http://safety.unimelb.edu.au/tools/incident/

Incident Reporting and Investigation - EHS Requirements (UOM0364) is available from: http://policy.unimelb.edu.au/UOM0364 <http://policy.unimelb.edu.au/UOM0364>

Safety Bulletin 02-09: EHS Incident Reporting and Investigation is available from: http://safety.unimelb.edu.au/docs/Safety_Bulletin_02_09_Incident_Reporting_Investigation.pdf <http://safety.unimelb.edu.au/docs/Safety_Bulletin_02_09_Incident_Reporting_Investigation.pdf>

Relevant Contacts

Earth Sciences School Manager

Richard Young 8344 9867

Earth Sciences, other contacts

Roland Maas (EHS Committee) 8344 6522, mob 0430 752 782;

Helen Russell (EHS Committee) 8344 9788

Kerrie Grieser 8344 9866

OHS & Injury Management (Arts Centre, corner Grattan/Swanston, level 5)

General contact 83443050

Steve Gugenheimer 83443052, 0411 111 265

John Carmichael 8344 9249, 0414 878 428

EHS Manager, Faculty of Science

Sam Montalto 8344 6924, 0425 800 085

WorkSafe 132 360

BASIC RESPONSIBILITIES

Students

Students

- are responsible for adopting safe work and study practices
- must report all hazards to their supervisor
- must report all incidents and near-misses to their instructor, academic in charge, or school management
- must not wilfully place at risk the health or safety of any other person at the University
- must not wilfully or recklessly interfere with or misuse anything provided in the interests of environment, health and safety or welfare at the University
- are required to comply with all University and Departmental rules and procedures which relate to environment, health and safety
- the use of certain facilities may require that students provide some items of personal protective equipment

Staff

- all employees are to comply with the School EHS Manual and relevant laboratory manuals
- adopt work practices that support EHS programs
- take reasonable care for the safety of his/her own health and safety and that of other people who may be affected by their conduct in the workplace
- seek guidance for all new or modified work procedures to ensure that any hazardous conditions, near misses and injuries are reported immediately to the supervisor. Most workplace injuries are related to changed work procedures
- must not wilfully place at risk the health or safety of any person in the workplace
- participate in meetings, training and other environment, health and safety activities
- must not wilfully or recklessly interfere with or misuse anything provided in the interest of environment health and safety or welfare
- wear personal protective equipment (PPE) as required in laboratory and/or fieldwork procedures; report missing PPE to supervisor
- use equipment in compliance with relevant guidelines, without wilful interference or misuse
- must cooperate with the University in relation to actions taken by the University to comply with Occupational Health & Safety legislation
- perform safety audits of work areas as required

Academic Staff & Supervisors

Academic staff are deemed to have principal supervisory duty for undergraduate and postgraduate student activities. They may also be in charge of a laboratory facility or lead fieldwork and other off-campus activities. Academics, as well as other university employees in a supervisory role (e.g. supervising students, visitors, laboratories, fieldwork) therefore have duties which go beyond those for all staff (see above). All of these duties aim at maintaining the same EHS standards for staff, students and visitors and include the following:

- identify and control hazardous conditions of all activities under your supervision
- develop safe and compliant work procedures as required, in conjunction with relevant experts
- provide staff, students, visitors (and even contractors) with relevant EHS information (inductions)
- ensure sound laboratory practices are maintained throughout (e.g. chemical management, compressed gas safety, laser and radiation safety, manual handling, plant management, personal protective equipment)
- develop and maintain laboratory manuals that are compliant with relevant EHS regulations
- provide adequate supervision through technical guidance and support
- ensure compliance with EHS procedures by regular performance review and inspections, implement corrective action and arrange monitoring where required
- identify health monitoring needs, in consultation with the University's Occupational Health Service
- participate in incident investigations as required

Additional responsibilities are specified elsewhere (see Building Emergency Controller, Floor Warden, First Aider Sections).

WORK AREAS

The School provides work areas for geology (petrography, paleontology, geochemistry, geochronology, rock deformation, hydrogeochemistry), meteorology and computing. Some of the laboratories contain hazardous chemicals, plant or instrumentation and are restricted access areas. Work Area Supervisors (WAS, designated below) are responsible for ensuring that safe work practices consistent with university and faculty EHS regulations are followed. Staff and students may require specialised training before being authorised to work in these laboratories or before undertaking certain laboratory procedures.

Work Area Supervisors

Level 1

Rock Store (Rm 101)	
Thin Section Laboratories (Rm 103-109, 127)	Malcom Wallace (x46526), Bin Fu (x47455)
Wilfey Table Room (Rm 104)	Barry Kohn (x47217)
X-ray Fluorescence Lab (Rm. 127)	Jon Woodhead (x46821)
Cold Room Laboratories (Rm 113b-114)*	Mark Peternell (until further notice, Jan 2011)
SEM/Microprobe Laboratories (Rm 129-131)	Graham Hutchinson (x47223; 0412 378 549)
Rock Crushing Laboratory (Rm 139)	Abaz Alimanovic (x43898; 0433 801 180)

Level 2

Teaching Laboratories (Rm 209, 218, 220)	Stephen Gallagher (x46513)
Mineral Separation Laboratory (Rm 221)	Abaz Alimanovic (x43898; 0433 801 180)
Mineral Separation OSL Dark Room (Rm 223)	Matt Cupper (x46521)

Level 3

UNIX Labs (Rm. 347, 348)	Kevin Walsh (x46523)
Computer Laboratories (Rm 313, 347, 348)	Brett Holman, Doug Morrison (x47307)
Palaeontology Laboratory (Rm 318)	Stephen Gallagher (x46513)
Sedimentology Laboratory (Rm 319-320)	Malcolm Wallace (x46526)
ICP Mass Spec. Lab (Rm 322)	Jon Woodhead (x46821) Roland Maas (x46522)
Speleothem Lab (Rm 341)	Roland Maas (x46522) Jon Woodhead (x46821)
Luminescence Dating Lab (Rm 327-329)	Matt Cupper (x46521)
Radiogenic Isotope Clean Lab (Rm 332-333)	Roland Maas (x46522) Alan Greig (x47618)
MSc Room (Rm 349-350)	Kevin Walsh (x46523)

Level 4

Noble Gas Laboratory (Rm 421, 426)	Dave Phillips (x47678) Stan Szczepanski (x49707)
Fission Track Lab. (Rm 422, 424, 428)	Barry Kohn (x47217)
Biohydrogeochemistry Lab (Rm 440, 445)	John Moreau (x46518)
U-Th-Pb Geochronology Lab (Rm. 433B)**	Jon Woodhead (x46821)
Cosmogenic Isotope Lab. (Rm 451)	Abaz Alimanovic (x43898)

Level 5

Synoptic / Meteorology Lab. (Rm 503)	Kevin Walsh (x46523)

* lab not in operation

** room number not final; lab established late 2010

HAZARD REPORTING

If you have any suggestions or concerns regarding safety or environmental issues within the School, or associated with off-campus activities, please raise them with your supervisor, or contact the School's EHS Committee (contacts see page 5 of this manual). Your concerns will be raised at the next EHS committee meeting or acted on straight away if required. You should be aware of your rights and obligations under the Victorian Occupational Health and Safety Act 2004 (check at http://www.workcover.vic.gov.au/). A good source of safety-related regulations and issues is the website of the University's OHS & Injury Management Department (formerly RMO or EHS Unit) (http://www.pb.unimelb.edu.au/ehs/ehs/index.php3).

Staff at OHS & Injury Management (e.g. John Carmichael, Steve Guggenheimer) and the EHS Manager, Faculty of Science, Sam Montalto, will also be able to help with safety and environmental issues (contacts see p.5).

Health & Safety Rep

The School of Earth Sciences does not at present have a staff-elected Health & Safety Representative (HSR) but school staff can access HSR's elsewhere within the faculty (see below). HSR's are available to intervene on behalf of staff in safety-related matters where normal lines of communication (e.g. staff member and supervisor, or staff and school management) have proven ineffective.

Colin Entwistle, Physics, x48117

Jenny Scott, Chemistry, x47623

Anton Cozijnsen, Botany, x45056

SAFE WORK PROCEDURES - Hazard Assessment

The School of Earth Sciences is committed to minimise the hazards to people and the environment. The relevant procedures have been developed with input from staff, students, the school's EHS Committee and the University's OHS & Injury Management Department. The underlying process is as follows:

Identify Hazards

Existing and potential workplace hazards (to people or the environment) have been identified and compiled in the Departmental Hazard Register. This is an on-going process – as the school changes, so do the hazards. Within the School of Earth Sciences, the main hazards are expected to exist in (i) off-campus field work (ii) rock processing and (iii) laboratory work. However, potential hazards also exist within offices.

Assess Risks for each Hazard

Assess and measure the risk of all processes and procedures identified as hazardous or potentially hazardous. Formal risk assessment (RA) should be a consultative process involving those actually doing the task and should take into account the experience and training of those involved. To assist with risk assessments, OHS & Injury Management provide downloadable 2D and 3D risk matrix assessment forms which can be used to rate risks according to a recognized formula. While these forms are very generic, they are recognized by the university and WORKSAFE and generally provide good guidance. **Do not use any other types of risk assessment forms – they are not recognised by WORKSAFE VICTORIA**. Completed RA forms must be compiled in relevant laboratory manuals and within the school's risk register. The official RA forms can be downloaded at http://www.pb.unimelb.edu.au/ehs/riskmanagement/ - RA_Gen.

Training in Risk Assessment

Formal training in Risk Assessment is available throughout the year and is mandatory for all staff involved in supervision of laboratories, field work and other potentially hazardous activities. The training is a single 2-hour session. Individuals can sign up for a training session by checking Themis; Training & Development. Alternatively, enquire with School EHS Committee for latest faculty-internal training opportunities.

While formal training in Risk Assessment is mandatory for supervisory staff, the risk assessment forms provided by the university can completed without specialised training. This allows their use by staff and postgraduate students for whom RA training is not mandatory. We recommend that all RA forms are completed with guidance from EHS Committee or an trained supervisor.

Develop Risk Control Measures

Develop a procedure to minimise the risk. Once a hazard has been identified and the risk quantified using RA, determine the most suitable risk control measure to be implemented. These measures will be documented in the 3D RA form document. The following hierarchy of controls shall be used:

1. Elimination of the hazard.
2. Substitution of the hazard.
3. Engineering controls.
4. Isolation or procedural (administrative) controls.
5. The use of Personal Protective Equipment.

In general, control measures 1-3 are preferred because they are least likely to be affected by human (mis-) behaviour. Control measure 4 is preferred over 5 but both rely on staff/students to be trained appropriately and to act responsibly and thoughtfully. Advice on risk minimisation should be sought from school EHS Committee, experienced workers, OHS & Injury Management (in particular the faculty's own EHS Manager, Sam Montalto), consultants or other suitable experts.

Where appropriate, hazardous tasks must be described and control procedures outlined in the form of a written document, often called "Safe Operating Procedure" or "SOP". An SOP should be written in clear, easy-to-understand language, with a proper chronological sequence. Any particular training requirements should be assessed and included in the SOP document. Those wishing to produce a new SOP may want to check existing SOP's within the school, within other schools and at (http://www.pb.unimelb.edu.au/ehs/) for guidance (an example SOP and an editable template can be found on the School's EHS webpage). When writing an SOP, use 'shall' or 'must' for mandatory actions and 'should' for advisory actions.

Trial

Trial the procedure with suitable workers and incorporate feedback.

Review

Review the procedure as part of annual review of the Environment and Safety Documentation.

Refer to the university's EHS manual (http://www.pb.unimelb.edu.au/ehs/)

SAFE WORK PROCEDURES - Environmental Impact Assessment

The School of Earth Sciences has a commitment to minimising our impact on the environment, both on campus and in the field. Consideration should be given to the following when assessing a procedure:

Air Emissions
- fume/dust extraction (chemical, radioactive, biological, dust)
- vehicle exhaust gas
- offensive odours
- noise
- electromagnetic radiation
- toxic smoke from building fires
- release of CFCs

Discharges to Natural Water Systems
- discharges to stormwater (including inadvertent spills & leaks)
- nutrification of natural waterways
- salination of soil and waters
- contamination of stormwater by rubbish
- contaminated water from fire fighting
- contamination of flood waters
- leakage of sewage into stormwater drains
- contaminated leachate and groundwater flowing to waterways
- suspended solids in stormwater
- risks associated with transport of hazardous substances

Land Pollution
- leakage from under/above-ground storage of hazardous substances
- leakage from pipes and equipment of hazardous substances
- landfill disposal of equipment containing hazardous substances
- landfill of general rubbish containing hazardous substances
- management of contaminated sites and contaminated fill
- land contamination associated with fieldwork
- disturbance of natural flora and fauna
- land erosion and degradation of natural habitat
- creation of conditions conducive to proliferation of weeds and pests

Waste Management
- non-compliance with legislated trade waste quality criteria
- backflow of contaminated water into town water supply lines
- non-segregation of waste preventing safe disposal, reuse or recycling
- inadequate containment of waste or labelling of waste containers
- waste disposal practices used by contractors working on-site

Heritage and Public Utility
- risks to preservation of heritage structures
- risks to preservation of aboriginal sites and archaeological relics
- risks to natural ecosystems, habitat and endangered flora/fauna
- reduction of public utility (traffic, noise, visual appeal, litter, vacant land)
- risk to public and environment from loss of process control (eg. fire)

Resource Usage - excessive or unnecessary usage of:
- electricity
- natural gas and LPG
- steam
- liquid fuel (eg. petrol, diesel, heating oil)
- water
- chemicals
- packaging
- paper

Opportunities for:
- recycling of waste heat
- recycling or re-use of water
- recycling or re-use of paper and packaging
- recycling or re-use of glass bottles/jars, aluminium/steel cans, plastic
- preferential use of recycled materials to support the recycling industry
- poor housekeeping leading to wastage and spoilage
- use of disposable items rather than re-useable products

Departmental Waste Management Procedures

Disposal of specialised waste

Hazardous waste	Many chemical waste types are disposed of within laboratories, according to local lab procedures (see also General Laboratory Safety). This includes waste acid, radioactive waste and waste solvents. For all other hazardous waste, the University offers a **monthly hazwaste collection** which takes place on the third Thursday each month. Watch for relevant email announcement from School Manager; if you don't receive such an email by the start of week 3, contact the School Manager.
Laboratory glass	**Clean laboratory glass** no longer needed (e.g. broken pyrex beakers, empty reagent bottles) are collected in a dedicated wheelie bin (located in room 326, Maas office) which is put out for collection in Tin Alley. The contents go to deep landfill. Glass should be rinsed to remove residual chemicals, and labels should be removed. **Contaminated laboratory glass** (with traces of radioactivity or other hazardous substances that cannot be removed safely) and plastic (e.g. empty hydrofluoric acid bottles) should be disposed of in the monthly hazwaste collection, see above. This includes used glass pipettes which should be collected within labs in dedicated closed containers; when containers are full, dispose entire container.
Batteries	A collection box for spent batteries (1.5-9V) is located in the photocopy room (408).

Current Recycling Schemes

Paper/Cardboard	Paper recycling boxes exist in many offices, laboratories and in computer labs. 240L recycling bins are located in front office and in the photocopy room, level 4. Cardboard box recycling is in the bale in the loading bay **NB.** It has been noted that the cleaners throw the contents of "recycled paper" boxes in with the rest of the office rubbish. If this is going on, does it still make sense to keep a recycled paper bin in offices. In response to this, Property & Campus Services have advised the School that all rubbish collected by the cleaners is later sorted at the waste transfer station, to pull out recyclables. As we cannot verify this, and to ensure that your recycling efforts are effective, it is suggested you keep your office recycling box where cleaners cannot see it, and empty it into the large recycling carton in the photocopy room on level 4. This is definitely the safer option.
Glass	Empty glass bottles (beverage bottles) are collected in a bin in the corner of the common room. This bin goes to recycling.
Printer cartridges	Spent printer cartridges are collected for recycling in a box located in Front Office, level 4.
Water	Water chillers associated with various mass spectrometers, SEM and electron microprobe are recirculating chillers and thus use negligible amounts of water. Other opportunities for water recycling exist (mineral separation incl. Wilfley table; RO water purification units) but have not been developed.
Chemicals	Sodium poly-tungstate (a heavy liquid used in mineral separation) is routinely recycled

SAFE WORK PROCEDURES - Environment Health & Safety Audits

Regular self audits of all work areas are required as part of the University's OHS/EHS regulations. Audits are announced by EHS Committee and are carried out by Work Area Supervisors (or a suitable nominated representative). At present, laboratory self-audits are conducted every 6 months (usually June and Nov/Dec). Work area audit checklists are made available at the time the audit round is announced by EHS Committee. This is done by email to all work area supervisors; the most up-to-date audit check list is attached to such emails. Do not use any other check list types.

Laboratories (including computer labs)

Work area supervisors are urged to complete their audits promptly, Any issues identified during the self-audit should be fixed promptly and the action noted on the audit form. Keep one copy of the completed self-audit form in the lab manual and hand another copy to Front Office (Karina Patrick) for central filing.

Following submission of the completed self-audit form, a member of the School's EHS Committee will visit selected work areas to verify the self-audit findings. Any additional problems or issues noted during these visits should be addressed promptly by work area supervisors (with assistance from the EHS Committee and/or school management). Walk-throughs routinely pick up compliance problems overlooked by the work area supervisor and therefore help maintain laboratory safety and compliance with Science Faculty EHS objectives/targets. **Persistent failure by a work area supervisor to act on identified safety issues will result in closure of the work area until the problem is fixed.**

Work areas may also be inspected by EHS consultants employed by the university, the so-called "internal" and "external" audits. These usually take place once a year. Non-compliance issues detected during such audits are recorded and need to be fixed to avoid heavy financial penalties. Audits by hired consultants are usually announced well ahead of time (up to 3 months) and will be preceded by an audit preparation period.

WorkSafe inspectors have the right to make unannounced visits to any workplace in the state

Offices

The majority of staff and students spend most of their working hours in their offices. It is therefore important that these work spaces are as safe as we can make them. Common OHS issues in offices are related to room temperature, lighting, noise, non-ergonomic PC work stations, faulty carpets, cluttering and/or poor work practices. Office self-audits – via check list - are done every 12 months and present an opportunity to systematically check your office and bring safety issues to the attention of school management. The School can often assist, e.g. by providing better furniture, help with improving your computer workstation (external keyboard and mouse for laptop users) and get damaged carpets and other maintenance issues fixed. However, a bit of initiative and DIY by office occupants can often bring about rapid improvements without producing even more work for school general staff.

SAFE WORK PROCEDURES -
Tagging Unserviceable Equipment

The School of Earth Sciences uses a “Danger/Out Of Service” tag system to warn / advise of hazardous or unserviceable equipment. The tags are used to de-commission a piece of equipment for safety or maintenance reasons. In addition, they ensure other staff and students are not exposed to potential hazards.

Normally the placing of a tag is the responsibility of the equipment operator. However, any person may tag a piece of equipment to indicate it should not be used.

Danger / Out Of Service tags are available in First Aid Kits or from Front Office (rm 401).

Procedure

Tagging equipment comes with the responsibility to organise repair (and removing the tag after successful repair) or de-commissioning of equipment. Not every user of the equipment is in a position to do all this (e.g. visitors, postgrad students, part-time staff). It is therefore advisable that faulty equipment be tagged by experienced full-time staff who can see the job through. Equipment faults should therefore be reported to such staff (work area supervisors, school management).

The tag must be completed in full and all information written clearly in the space provided. It should then be attached in an obvious position on the equipment.

Equipment MUST NOT be used or operated if a Danger / Out Of Service tag is attached. If necessary, the tagged equipment must be locked up to prevent use.

The relevant work area supervisor will keep users informed about the status of repair, replacement or decommissioning of the equipment.

Installations

Many pieces of electronic/electrical equipment (e.g. desktop computers, small analytical instruments, small appliances) can be set up by the users, provided they follow the relevant set-up instructions provided with the equipment. Do not set up equipment that has been tagged-out by the university-wide electrical safety testers (see below). All major pieces of electronic equipment are usually set up by a qualified technician, engineer or electrician. If in doubt, consult the manufacturer, point of sale or Property & Campus Services (aka Maintenance, call x46000).

University purchasing procedures require that all equipment purchasing requisitions are accompanied by a pre-purchase safety check (see back of purchase req form) to be carried out by the purchaser (not the purchasing officer). Once the goods arrive, the purchaser is required to carry out a post-purchase check of the goods (e.g. does equipment meet relevant Australian standards ?; are MSDS's included with chemicals ?). Provide post-purchase safety information to purchasing officer (Helen Russell). More details, see next page.

Use

The Work Area Supervisor should provide sufficient training in the use of electrical equipment. Such training should be entered in the relevant laboratory induction records kept in the lab safety folder.

Electrical equipment, especially portable items and their leads should not be located next to water taps and sinks.

Electrical leads must not run across floor area where they could become a tripping hazard. Consider running the cable along the wall (secured with cable clips, bluetack). Where routing of a lead or data cable across open floorspace is unavoidable, appropriate protection (e.g. cable protectors) should be considered (ask a member of the EHS committee for advice if unsure)

Extension leads should only be used on a temporary basis.

Use power boards, not double adaptors.

Faults

Faulty equipment must be tagged with Danger Tags (see 'Tagging'), warning that the equipment is faulty, out of operation and is not to be activated. Tags are available in First Aid Kits or from the Main Office.

All faulty wiring and equipment must be reported immediately to the Work Area Supervisor who is expected to organise repair (ensure faulty equipment cannot be used until repaired). Where repair is not a practical option, consider disposal or lock-away until a repair can be made.

Inspection

Since 2006, all portable electronic/electrical gear powered from a normal power point is inspected once a year by an external contractor (NUVO). All tested items are entered on a register and receive a colored test tag. The NUVO testers will test absolutely everything they see in offices, including private and obsolete equipment lying around on shelves. More information may be obtained from Property & Campus Services (x46000).

Privately owned electrical equipment

Both staff and students occasionally use their own electrical equipment within the school building. Common items are laptop computers, cooling fans, portable heaters, radios/CD players, kettles, toasters and coffee machines. In some cases, such items become part of the furniture and are inherited by subsequent office/lab occupants. While many items are new, some people will be tempted to bring in "the old coil heater" from home to help them cope with low office temperatures.

In general, the university discourages the use of privately-owned equipment at work, mainly because such equipment is sometimes old and potentially hazardous. However, it is recognised that use of such equipment is a reality (e.g. laptop computers). Like all portable electric/electronic items run from a power point, privately-owned electrical equipment kept in offices and labs will be tested by the NUVO contractors and goes on their register. If it does not pass the test and is tagged-out, the owner must take responsibility and repair/remove the item. Any tagged-out items found in offices or labs during walk-throughs related to office/lab inspections may be disabled and discarded without further investigation.

SAFE WORK PROCEDURES - Purchasing

Environmental and safety requirements must be evaluated and incorporated into all purchasing specifications for services and goods, including contract specifications. The Faculty of Science has preferred suppliers which should be used whenever possible. The following items must be included on purchase orders (check back of form):

- Material Safety Data Sheets (MSDS's) should be requested with all purchased chemicals, in particular those that are specialised and rarely used (e.g. ion exchange resins). Most other MSDS's will normally be available free of charge from the University's **ChemFFx database** http://safety.unimelb.edu.au/unimelb-only/chemffx.html Instructions on how to use ChemFFx can be found in the appendix at the back of this manual
- Purchased goods must be packaged and transported in compliance with the current Australian Dangerous Goods Transport Code (Code 6) www.infrastructure.gov.au/transport/australia/dangerous/dg_code_6e.aspx
- Goods or services requested must comply with Australian Standards or appropriate regulations and these must be quoted on the order
- All equipment will be supplied with complete operating instructions and safety information
- Service and repair personnel must have appropriate training and experience to enable them to complete the purchase request safely
- All service work will meet the appropriate Australian Standard and Codes of Practice
- Potential safety hazards must be assessed and appropriate risk minimisation measures implemented
- Environmental aspects must be assessed and appropriate risk minimisation measures implemented

The School of Earth Sciences has introduced procedures to comply with these requirements pre- and post-purchase:

- A pre-purchase safety checklist is available on the School's standard purchasing requisition form. This list captures aspects of Chemical Management, compliance with Australian Standards, Risk Assessments, Electrical Safety, IT Management, PPE standards and ergonometric requirements
- Post-purchase, the recipients of newly arrived goods are required to check the goods and report back to the Purchasing Officer

For more information, ask the School's Purchasing Officer, Helen Russell (rm 412, x 49788)

Hazards potentially present in laboratories include:
- cuts, chemical splashes and eye accidents
- fire and burns
- explosive and other violent reactions
- toxic hazards
- electricity and gas
- radiation
- physical hazards from equipment
- chemical spills

Poor housekeeping, thoughtlessness, haste, lack of knowledge and/or experience exaggerate these hazards.
Before starting work in a laboratory you should assess:
- The layout of the laboratory, eg. the location of exits and their ease of access
- Can the Building evacuation alarm be heard in the room ?
- The safety equipment in the laboratory, eg. note location of nearest fire extinguishers, how they are used and for what type of fire, break-glass alarms, fire blankets, first-aid kit and nearest person trained in first aid,
- Safety showers, free cold water taps, spill kits (their contents and use) – these things will be covered in your induction / training
- The location of the main or emergency power switches (or emergency STOP buttons)
- The dangers associated with the chemicals or equipment you will be using
- The waste disposal procedure for the chemicals / products you will be using.
- Any environmental aspects relevant to processes in the laboratory

Environment & Safety Regulations

All work areas within the School of Earth Sciences are supervised by a work area supervisor (WAS) who is expected to have completed certain EHS training modules offered by the University.

All staff in a supervisory role are expected to have completed

-EHS Roles and Responsibilities for people in a supervisory role (obligatory)

and many of those should also complete

-Risk Management and Incident Response & Investigation

Work Area Supervisors and others acting in a (temporary or permanent) supervisory role are also expected to have completed the following hazard-specific training modules (depending on their work areas):

-Chemical Management
-Laser & Radiation Safety
-Manual Handling
-BioSafety
-Compressed Gas Safety

other training modules of potential interest and usefulness are

-Hazardous Waste Management & Emergency Spill Response
-Personal Protective Equipment (PPE)
-ChemWatch database

Date, time and venue of training sessions organised by the University's OHS Dept can be found in your Themis Self Help menu (Training and Development/ Env, Health & Safety/browse by category) where enrolments can be made electronically. Many sessions are also put on within the Science Faculty (e.g. Bio21, or FacSci EHS Manager); information on upcoming training sessions can be obtained from Earth Sciences EHS Committee (contact Roland Maas, x46522, maasr@unimelb.edu.au).

Lab inductions

Work in most laboratories in the School of Earth Sciences is regulated by the relevant laboratory manual, and users will need to undergo a lab/task-specific induction training followed by an assessment of competence and supervision requirements. **The induction training is usually provided by the work area supervisor (WAS) and needs to be documented and recorded**. The induction training will cover all the usual areas (personal protective equipment - PPE, emergency response, chemical and/or physical hazards) as well as introduce users to the specific safe operating procedures (SOP's) relevant to the work area.

Besides such lab-specific instructions, there are a number of general rules that need to be followed:

NO FOOD OR DRINK is to be taken into or consumed in the laboratory or stored in laboratory refrigerators or freezers. No food containers are to be used to store chemicals. This last rule is particularly important – there are well-documented cases of children drinking laboratory bleach or solvents stored in lemonade bottles ! It is irrelevant in this context how the children had access (cleaners, staff and students have all been known to bring kids to the department). Once they have swallowed the chlorine bleach, it's too late to ponder what may have been.

APPROPRIATE PROTECTIVE CLOTHING must be worn for protection in case of chemical spills. This is usually a knee-length white coat and closed-toe footwear, but for some hazardous operations more elaborate protection may be required. Laboratory coats and other protective clothing are/is not to be worn in offices or in the staff room. Protective gloves should be removed before leaving the laboratory. DO NOT wear gloves when opening doors or answering the telephone.

SAFETY EQUIPMENT AND PROCEDURES provided in all work areas must be used or referred to as appropriate.

SAFETY GLASSES must be worn for all procedures with a risk of eye injury. Do not use contact lenses if your work exposes you to chemicals – some chemicals can penetrate the layer of tear fluid between the lens and the cornea of the eye. Removal of contact lenses can then be very difficult and the risk of eye injury is greatly increased.

SOUND FOOTWEAR must be worn in laboratories. Bare feet, thongs, sandals, clogs and other open-style shoes are PROHIBITED.

VISITORS to laboratories must be provided with appropriate safety equipment.

STRICTLY NO ALCOHOL CONSUMPTION in laboratories and offices. Never work in labs after consuming alcohol.

FEELING UNWELL, IN A HURRY ? If your mind is not 100% on the job, working in a potentially hazardous place is not a good idea.

DECANTED CHEMICALS MUST BE PROPERLY LABELLED AND STORED Bottles, boxes etc containing decanted chemicals (chemicals no longer stored in their original containers, i.e. those purchased from commercial supplier) in laboratories must be labelled with a chemical name and a hazard diamond where applicable. Bottle labels ("right-to-know") for many common chemicals may be down-loaded from the School of Chemistry's Chemical Safety site, http://safety.chemistry.unimelb.edu.au/Chemsafety.php. or may be drawn and printed using the ChemFFx software (http://safety.unimelb.edu.au/unimelb-only/chemffx.html). Where a container is too small or there are many sample vials with hazardous contents (e.g. sets of acidified water samples), the box, rack, drawer etc or sample holder must be labelled with the name and hazard diamond. Hazard diamonds can be purchased from the Chemistry Store. All chemicals must be stored in appropriate spill trays (bunding). Lack of comprehensive bunding is one of the most common issues identified in lab safety audits; it is the issue most readily spotted by external and WorkSafe inspectors. These and other chemical management issues are the subject of the Chemical Management Training offered by the University.

MATERIAL SAFETY DATA SHEETS (MSDS) MUST BE OBTAINED BEFORE USING A CHEMICAL. An MSDS provides information on a reagent, its properties, hazards and on its use and storage. It also provides information on what to do in case of a spill, protective equipment to wear while using it, incompatibilities with other substances, toxicological information and any special requirements for use. MSDS's kept in laboratory safety folders must not be older than 5 years.

MSDS's are usually obtained from the supplier at the time of purchase. However, reagents purchased from the School of Chemistry store do not come with an MSDS. In these and other cases where no MSDS is supplied, the lab manager must obtain MSDS's from another source, such as the internet. The best place to access MSDS's is the University's **ChemFFx database** http://safety.unimelb.edu.au/unimelb-only/chemffx.html Details on the use of this system can be found in the appendix at the back of this manual.

DISPOSAL OF HAZARDOUS MATERIALS All hazardous waste must be disposed of in a safe and environmentally responsible manner. The following substances must not be disposed of down the sink: carcinogens, mutagens and teratogens (inhibit development of a fetus), heavy metals, pesticides and herbicides, polychlorinated biphenyls, chlorinated hydrocarbons, organic solvents, photographic chemicals, un-neutralised acids or alkalis and any other substance that has the potential to adversely affect the receiving system.

Hazardous Operations

Hazardous experimental work should be undertaken within normal working hours, to maximise the chances of help being available quickly, should something go seriously wrong. When hazardous operations have to be performed outside normal working hours, the researcher must ensure that a second person is present within the immediate vicinity throughout the experiment.

SAFE WORK PROCEDURES - Acids

Use

Handling of strong acids. Mixing various concentrations of aqueous acid solutions.

Hazards

Class 8 – Corrosives. Acids – eg. nitric, sulphuric, hydrochloric, acetic, phosphoric, hydrofluoric, hydrobromic, boric. Risk of burns to skin, eyes and mucous membranes.

Hydrofluoric acid (a S7 scheduled poison) is discussed separately, see below.

Risk Control Measures

Get your induction training and ensure you know your laboratory environment. Follow lab safety regulations. Use personal protective equipment as prescribed in the lab safety manual: lab coat or coverall, sturdy closed-type shoes, safety goggles or face shield, gloves (disposable latex, nitrile, neoprene or PVC). Wear rubber, neoprene, or PVC apron when using large quantities and splash potential exists. Handling large volumes of acid is always very risky (what would you do in case of a spill ?) – you and/or your supervisor might be able to find a way that avoids dealing with large acid volumes altogether. Always add concentrated acid to water to dilute – never add water to acid. Only use concentrated acids after receiving safety training (Laboratory Induction / Authorisation). Work in fume cupboards to avoid exposure to acidic fumes. Carry acid bottles only in approved carriers. Be particularly careful with hot acids as these can do more damage more quickly. Always ask the work areas supervisor if not sure.

Engineering / Ventilation Controls

Use concentrated acids only in fume hood. A safety shower and eyewash must be available and accessible when working with corrosive liquids.

Storage Requirements

Mineral acids should be stored separately from organic compounds. This is particularly so for strong oxidisers such as nitric and perchloric acid. Store acetic and other organic acids with other organic liquids. For a list of what should not be stored with what check “Incompatible Chemicals” on the School of Chemistry’s ChemSafety webpage (http://safety.chemistry.unimelb.edu.au/Chemsafety.php). For hazard class definitions (class diamonds) and maximum permissible acid volumes, check http://safety.chemistry.unimelb.edu.au/pdf/Storage.pdf

Proper chemical management involves placing all chemicals within spill trays (bunding). Spill trays should be big enough, robust and made of material that will not dissolve if the chemical leaks from its primary container. Common household plastic trays and containers (often made from polyethylene, PE) as sold in hardware stores and supermarkets are good low-cost options.

The University offers regular free 2-hour training sessions in Chemical Management where all relevant aspects are discussed. To find out about these training sessions, check ‘Training & Development” in Themis, ask the School EHS Officer (see page 3) or contact the Faculty of Science EHS Manager (sam.montalto@unimelb.edu.au). Information on this topic is also available from the School of Chemistry’s ChemSafety webpage and from the laboratory manuals of individual labs.

First Aid / Spill Control Procedures

Skin exposure: Rinse affected skin with plenty of water while removing contaminated clothing and shoes. Rinse for at least 15 minutes. Seek medical attention.
Eye exposure: Splashes may cause tissue destruction. Wash eyes for at least 15 minutes, lifting the upper and lower eyelids occasionally. Seek medical attention immediately.
Small spills: If you are unsure of what to do, call the work area supervisor. Otherwise: wear coat, gloves and goggles; cover spill with sodium bicarbonate; when reaction stops, pick up liquid with damp sponge or paper towels. Sponge can be washed out in sink, used paper towels can be discarded in normal lab rubbish.
Large Spills: Notify others in the area of spill, evacuate area if necessary; wear coat, gloves and goggles; cover spill with sodium bicarbonate; use vermiculite to absorb neutralized spill. Contact work area supervisor. Consider carefully how to dispose of contaminated vermiculite – may have to store until hazwaste removal can be arranged.

Disposal

Acids neutralised with sodium bicarbonate. Always check neutralised water with pH paper (pH needs to be 7). Neutralized water can go down the lab sink.

SAFE WORK PROCEDURES - Hydrofluoric (HF) Acid

Hydrofluoric acid is a colourless liquid containing hydrogen fluoride as an aqueous solution.

Hazards

Hydrofluoric acid (HF) is a strong mineral acid classified as extremely toxic. It is schedule 7 (S7) poison.

When HF (even in very dilute solution) comes into contact with the body it readily penetrates the skin and removes calcium from the tissues (eg., in skin, muscles and bone) causing destruction of deep tissue layers. This process can continue for up to several days unless properly treated with an antidote containing Calcium Gluconate. Tissue destruction is accompanied by severe pain. This is probably due to immobilisation of calcium resulting in an excess of potassium ions and subsequent potassium nerve stimulation. Extensive contact is potentially fatal.

Burns from a dilute HF solution may not be noticed for some time (can be hours). The first symptom is a rapidly strengthening throbbing pain at the burn site. Death of skin, tissues, blood vessels and even bone may follow. Inhalation causes an intolerable prickling beneath the breastbone. Nausea, vomiting, diarrhoea and ulcerations of the gums may also occur. Contamination by hydrofluoric acid is very serious and treatment should commence immediately. Wearing clothing that has absorbed small amounts of HF can result in serious delayed effects such as painful, slow-healing skin ulcers.

Risk Control Measures

- No-one is to use HF unless they have been instructed and 'authorised' by the Laboratory Supervisor
- HF must always be used in the designated fumehood
- Adequate signs must be displayed on the fumehood when samples are left unattended
- No-one is to use HF after hours unless there is someone else in the laboratory
- No more than 250ml of 50% HF is to be used for a single sample, and no more than one litre is to be used at any time
- Ensure that Calcium Gluconate Gel and eyewash are readily available (kept in lab)
- Ensure that saturated solutions of slaked lime ($CaCl_2$) or sodium bicarbonate ($NaHCO_3$) are available
- Ensure you have ready access to a good supply of running water and know the location of the safety shower / eye wash
- Have all the equipment you need for your procedure close at hand
- Always use containers and beakers in a plastic tray to contain any spills
- Clean up possible acid spills (e.g. drops of dilute HF in fume cupboard) to protect other workers
- Let others know you are working with HF

Personal Protective Clothing

When using HF, you must wear the following protective clothing:

- laboratory coat
- safety glasses
- neoprene gloves, or nitrile gloves for very small volumes of HF
- long trousers
- closed-type sturdy shoes

First Aid

HF is extremely toxic and corrosive, and prompt first aid treatment is imperative. **Do not panic – proper first aid and decontamination fixes most cases without further adverse effects. Follow the First Aid procedures calmly and thoroughly:**

Contact with skin

- remove casualty from contamination
- remove contaminated clothing
- wash contaminated area with running water for at least 10 minutes
- using a gloved finger, apply calcium gluconate gel on and around the area
- if pain subsides after initial washing and calcium gluconate application, continue application of the gel for at least another 15 minutes, then cover area with a dressing soaked in Calcium Gluconate and bandage it lightly
- although the crisis may appear to be over, it is a good idea to see a doctor for further treatment and advice
- where pain persists, or where more than just a drop of HF is involved, always transfer to hospital or medical centre quickly after the initial first aid (washing, gel); further treatment by a doctor may involve injections of calcium gluconate solution under the burn site, to immobilise the HF (note: calcium gluconate solution is only available in large city pharmacies and hospital pharmacies)

Contact with Eye
- Irrigate eyes with cool water
- Irrigate eyes with sterile saline eyewash. Do not use Calcium Gluconate Gel.
- Seek medical help (preferably the Eye and Ear Hospital Ph. 0-9929 8400)

Swallowed
(Symptoms: burns on lips, diarrhoea, vomiting)
- Do not induce vomiting
- Drink warm water
- Keep warm
- Drink milk/raw egg to protect mucous linings
- Seek medical attention

Inhalation
- Remove affected person to fresh air
- If necessary, resuscitate affected person
- Give oxygen if available
- Seek medical attention

One of the problems with recognising HF burns is that contact with concentrations less than 50% w/v may not produce clinical symptoms for 1 to 8 hours, and the latent period for concentrations less than 20% may be up to 24 hours. However, the damage is the same.

Suspect you have a HF burn but are not sure ?

Often symptoms from HF burns do not manifest until several hours after exposure. **If you suspect you may have spilled HF on your skin or eyes, but do not experience any immediate symptoms, apply the initial first aid measures (washing, gel or eyewash) regardless**. **Inform the Work Area Supervisor to get support and further advice. Then go and see a doctor**. The nearest hospital emergencies are the Alfred Hospital on Flemington Rd, Parkville, and St Vincent's, cnr Nicholson St/Victoria Parade, Fitzroy. If you are quite sure that contact did not occur but have a nagging doubt, take the tube of calcium gluconate gel home with you and re-apply to the suspect area a few times. If symptoms occur later, seek medical treatment. Always inform the work area supervisor or others working in the lab that you are taking the gel - they will want to organize another tube.

Reporting

Report all HF splashes on skin and eyes to the Laboratory Supervisor and lodge an Accident/Incident Report

IMPORTANT
No casualty exposed to hydrofluoric acid should be allowed to go home or return to work without having seen a doctor who is made aware of the nature and extent of the exposure.

HF Spill Control Procedures

Small spills
- Wear gloves, coat, goggles
- Dilute spill with water
- Neutralise with slaked lime (saturated CaCl2) or sodium bicarbonate (NaHCO3) powder
- Leave for several minutes; maybe add some more bicarb to ensure there is no acidity left
- Pick up liquid with vermiculite from spill kit, or with several paper towels (if spill is very small)
- Pack vermiculite and/or wet paper towels in a double plastic bag, seal, label, and dispose of in next hazwaste collection (3rd Thursday each month)
- Wash contaminated area with plenty of water

Spills on clothing
- Remove contaminated item of clothing
- Neutralize with sodium bicarbonate (NaHCO3) solution.
- Rinse with plenty of water

Disposal of waste HF

Waste HF is diluted strongly, followed by neutralisation with bicarbonate and lime. Alternatively, diluted waste HF is stored in the laboratory's acid store in appropriately labelled strong plastic containers in a robust spill tray, until hazwaste collection can be arranged. The original HF containers (always plastic) can be rinsed out if this can be done safely, and then disposed of in the laboratory glass bin. The 0.5 L AR HF bottles sold by ChemStore cannot be opened and rinsed and should be disposed of in the monthly hazwaste collection. Information about the monthly hazwaste collection scheme is disseminated each month by the ES School manager (watch for relevant email in the third week each month)

SAFE WORK PROCEDURES - Other Toxic Chemicals

Laboratories within the School use a variety of substances listed as scheduled poisons, typically schedule 5 (S5 poisons) and schedule 6 (S6.1 toxic substances). Examples of S5 poisons are acetone, acetic acid, boric acid, weak hydrochloric acid, hydrogen peroxide (<20 vol%), petrol and weak nitric acid. Examples of S6 toxic substances include beryllium (beryllium disease), bromoform, hydrogen peroxide (>20vol%), as well as strong nitric and hydrochloric acid. Hydrofluoric acid is a Schedule 7 (S7) poison. The amounts used are usually small (<1 litre) and use is infrequent (apart from nitric and hydrochloric acid). Nevertheless, S5-S7 substances are hazardous.

Hazards

Class 6.1 Toxic substances

These are substances liable either to cause death or serious injury or to harm human health if swallowed or inhaled, or by skin contact. The effect on the worker depends on the chemical, exposure time, amount and individual susceptibility. Problems arise in the workplace when workers are not aware of the chemical hazards or the safety precautions that must be taken.

Risk Control Measures

- Read the Material Safety Data Sheet (MSDS) for the chemical before you use it.
- Regard all chemicals as hazardous until you know otherwise. Avoid skin contact or inhalation.
- Use fume hoods for handling toxic compounds and for conducting any processes that are likely to emit noxious gas, vapour, dust or mist.
- Prevent spills and absorption of chemicals through the skin by wearing suitable protective clothing, eg. laboratory coat, safety glasses or goggles, proper footwear, impermeable gloves and promptly wash off any chemicals spilled on the skin or splashed into eyes with plenty of cold water. Hands should be washed thoroughly after using chemicals and before leaving the laboratory.
- Prevent ingestion of chemicals. Never pipette chemicals by mouth (use safety bulbs). Never taste or smell chemicals.
- Do not consume or keep food and drink in a laboratory.
- Clean up any spills of chemicals on benches or floor immediately.
- All samples removed from stock containers should be clearly and appropriately labelled (with a use by date where applicable and a Hazchem class diamond).
- Apparatus and reagents should be cleaned and put away immediately after use. Return all equipment not in use to its proper place in a clean and working condition.
- Clean up after each stage of an experiment. Apparatus that contains harmful chemicals should be rinsed before being left for final cleaning.
- The minimum quantities of hazardous chemicals should be stored in the laboratory.

Engineering / Ventilation Controls

Ensure access to an eye wash and safety shower (only one safety shower in Earth Sciences, rm 332) in areas where toxic chemicals are used. Handle toxic chemicals in a fume hood.

Storage Requirements

Store in a cool, dry place away from strong oxidizing agents. Keep containers tightly closed. Use with adequate ventilation.

First Aid / Spill Control Procedures

Refer to the MSDS for the toxic chemical for specific first aid and spill procedures.
Wash off immediately with copious amounts of cold water (at least 10 minutes). In case of contact with eyes, immediately flush eyes with copious amounts of water for at least 15 minutes.
Seek medical attention - Poisons Information Centre (0 13 1126).

Disposal

Waste toxins should be held in the appropriate laboratory chemical store in appropriately labelled containers. Use hazchem disposal every third Thursday a month, watch for email from Earth Sciences manager

Records to be kept by Work Area Supervisors

- Training and authorisation of personnel to use toxic chemicals – induction records to be kept in Lab safety folder
- Material Safety Data sheets for any chemicals to be kept in Lab safety folder

SAFE WORK PROCEDURES - Flammable Liquids

Flammable liquids are sorted into four sub-classes according to their flash points. The flashpoint is the lowest temperature at which a flammable liquid will give off enough vapour to ignite briefly when exposed to a flame. The four sub-classes are:

- Class 3.PGII A liquid having a flash point < 21° C
- Class 3.PGIII A liquid having a flashpoint >21° C and < 60° C
- Class 3.CI A combustible liquid having a flashpoint > 60° C and <150° C
- Class 3.C2 A combustible liquid having a flashpoint > 150° C

For flammable liquids with a flashpoint below normal room temperature, a serious fire hazard may be present unless appropriate precautions and controls are used.

Hazards DG Class 3 – Flammable liquids. Risk of fire, explosion.

Risk Control Measures

- Read the Material Safety Data Sheet (MSDS) for the flammable liquid before you use it.
- Reduce to the absolute minimum the quantities of flammable liquids used in chemical operations or held in temporary storage.
- All potential sources of ignition must be kept from the working area.
- Transport flammable liquids carefully in stout glassware and in quantities comfortably within your control.
- Winchesters (2.5L) should be carried only in special enclosed plastic carriers.
- Make sure you know where the fire extinguishers (suitable for flammable liquids) and fire blankets are and how to use them.

Engineering / Ventilation Controls

Flammable liquids (apart from ethanol) should be used in fume hoods, and any spills on skin and clothes washed off immediately. Ensure access to a safety shower and eye wash in areas where toxic solvents are used.

Storage Requirements, see (http://safety.chemistry.unimelb.edu.au/Chemsafety.php)

Flammable liquids belonging to packing group I and II (low flashpoints: acetone, methanol, ethanol) must be stored in an approved fire-resistant cabinet ("flammables cabinet" AS. 1940-1993) **if the volumes exceed 50 litres per 50 m^2**. Smaller volumes do not require storage within a flammables cabinet. Storage sites, fire-resistant or not, must be sited as far away from sources of ignition as possible. The doors must be closed properly. NEVER store flammable liquids in domestic type refrigerators as ignition and fire may occur from the normal sparking of ordinary switches or devices in such units. Store away from oxidizers (e.g. nitric, perchloric acid, hydrogen peroxide) and spontaneously combustible chemicals in accordance with AS 2243.

First Aid / Spill Control Procedures

Any spills of flammable liquids must be cleaned up immediately and the materials used in the clean up should be disposed of safely, refer to the MSDS. Wash off immediately with copious amounts of cold water (at least 10 minutes). Contaminated clothing should be removed as soon as possible and thoroughly washed.
Contact with eyes - immediately flush eyes with copious amounts of water for at least 15 minutes.
Seek medical attention - Poisons Information Centre (0 13 1126).
Small spill: Do not attempt clean up if you feel unsure of your ability to do so or if you perceive the risk to be greater than normal laboratory operations. Use vermiculite or other spill absorbent material to soak up spill. Place in labelled waste container ready for disposal.
Large Spill: Notify others in the area of spill. Evacuate area.

Disposal

Acetone waste must never be tipped down the sink (tradewaste). Options for waste acetone disposal include (i) monthly hazwaste removal service (costs money) and (ii) evaporation in a fume cupboard (contact Abaz Alimanovic or Roland Maas). Methanol and ethanol can go to tradewaste in small quantities. Large waste volumes of any flammable liquid should be removed in the monthly hazwaste collection.

Records to be kept by Work Area Supervisors

- Material Safety Data sheets (<5 years old) for any chemicals to be kept in lab safety folder.

SAFE WORK PROCEDURES - Gas Cylinders

Compressed gases (defined as Class 2 by the Dangerous Goods [Storage and Handling] Regulations 1989) are divided into three types: (i) flammable, (ii) non-flammable and non-toxic, (iii) toxic. It is vital that Material Safety Data Sheets are available and understood by those working with compressed gases. Only the appropriate equipment should be used for each gas, and this should be maintained according to the manufacturer's directions. The University's OHS & Injury Management Dept. offers regular training sessions in Compressed Gas Safety, and all relevant staff must attend this training. Other staff and students handling compressed gas cylinders must be trained appropriately by the work area supervisor.

The School of Earth Sciences gas cylinder storage facility is in the loading bay.

The following rules apply to gas cylinders (for a more extensive list, consult www.boc.com.au):

- Gas cylinders must only be transported on a properly constructed trolley to which the cylinder must be securely strapped.
- Gas cylinders must be firmly secured to the bench or wall with an approved restraint.
- Only gas cylinders connected to a piece of equipment are to be stored in the laboratory. No spare cylinders (full or empty) should be stored in the workplace. Use gas cylinder storage in loading bay.
- Valves should be opened carefully; they should be unscrewed more than 2 or 3 turns, but never fully opened.
- Check for leaks after cylinder installation.
- Always check cylinder markings to be sure that it contains the correct material for the job.
- To shut a cylinder off, turn the cylinder valve off and then relieve regulator pressure.
- Ensure equipment is in good working order. Do not use faulty valves, regulators or gauges. Ensure adequate precautions are taken if the gas is poisonous or corrosive (refer to risk assessment and safe work procedure).
- Regulators used on cylinders must be of the appropriate type for the intended use. If in doubt consult the technical manuals provided on the BOC and Air Liquide websites. Older style welding regulators are not suited to modern high pressure cylinders that have up to 147 atmospheres of stored pressure.

Records to be kept by Work Area Supervisors

- Training records for personnel, to be kept in lab safety folder
- Material Safety Data sheets for compressed gases.
- Risk assessments for hazardous compressed gases.
- Manual handling risk assessments for individual laboratory personnel moving gas cylinders.

SAFE WORK PROCEDURES - Rock Crushing

The School of Earth Sciences rock crushing (and milling) facilities are located in room 139 (access from the stairs leading to the backyard at eastern end of building). This room is equipped with a powerful dust extraction system and houses a Rocklabs Boyd Crusher (jaw crusher, produces 0.5-1 cm rock chips), a Rocklabs standard ring mill (for grinding chips to fine powder in tungsten carbide, steel or agate ring mills), a disc mill (for grinding chips to sand) and a hydraulic rock splitter.

The rock crushing laboratory is supervised by Abaz Alimanovic (ph x43898, email: abaza@unimelb.edu.au).

Training & Authorisation

Use of the rock crushing equipment (in the rock crushing lab, #139) is coordinated through, and must be authorised by, the work area supervisor. The work area supervisor will provide the relevant induction training. The key to room 139 can be signed out from Front Office after arrangement with the work area supervisor.

In general, the lab should only be used during normal office hours, for safety reasons. Notify others of your intent to use.

The ring-mill should not be left unattended during operation.

Keep facility clean to minimize cross-contamination and formation of airborne dust.

Hazards

Rock crushing and milling produces a certain amount of dust which constitutes a potential health hazard. Other potential hazards are noise, injury through falling heavy objects, operation of powerful mechanical equipment (classified as plant) and eye damage.

Engineering Controls

Dust extraction fans must be operating for any work in the crushing lab.

Emergency cut out switches must be tested prior to operating equipment.

The safety barriers provided on all 4 pieces of equipment must be engaged during operation.

Training

All users must have the relevant training to use the crushing/milling technique, and they must be registered users

Personal Protective Equipment (PPE)

Safety glasses must be worn at all times.

Hearing protection must be worn at all times.

Proper footwear and a laboratory coat must be worn.

Personal respirator masks must be worn.

Users found violating any of the safety regulations (e.g. inadequate PPE) may be denied further access.

Building Alarm

The normal building evacuation alarm is very difficult to hear in rock crushing laboratory. Since April 2009, a strobe light alarm is available in room 139. When you first use the laboratory, familiarise yourself with the location of this alarm light.

SAFE WORK PROCEDURES - Radioactivity and Lasers

Hazard

The School operates a number of labs where radioactive substances (open and closed sources) and/or laser radiation are used. In general, volumes of radioisotopes and radiation level produced are very small, and laser beam paths are enclosed for user protection.

Training & Authorisation

Nobody should work with radioactive materials and lasers until they have completed the relevant lab induction training provided by the Work Area Supervisor. Possible exceptions include short-term users of laser ablation facilities supervised at all times by a trained user. Those working regularly with radiation are expected to complete training sessions on **Ionising Radiation** and/or **Laser Safety** offered by Steve Guggenheimer (University Radiation Safety Officer) several times per year. For more information, contact the School of Earth Sciences Radiation Safety Officer, RSO (Roland Maas, ph x46522, email: maasr@unimelb.edu.au), or the Deputy RSO (Mark Kendrick, ph x46933, email: mark.kendrick@unimelb.edu.au.

All personnel working with radioactive materials should receive local training in:

- the nature of any associated hazard.
- minimisation of the hazard.
- methods of protecting against damage.
- recognition, assessment and possible treatment of any effect from over-exposure.
- the necessity of incident / accident reporting.
- monitoring requirements

Laboratory managers must ensure they (or the university) have all the relevant licences to hold and use radio-isotopes. Ensure such licences are kept up-to-date. All relevant info should be supplied to the School Radiation Safety Officer

Procedures

The following regulations apply:

- access to the laboratory radiation areas is restricted to authorised personnel only.
- all personnel working with radiation are required to wear TLD badges, to measure personal exposure levels.
- adequate facilities, shielding and Personal Protective Equipment must be supplied and used.
- exposure time must be kept to a minimum, unnecessary exposure will lead to an increased radiation dose.
- Maintain as much distance to the radioactive source as practicable to minimise the radiation dose.
- Radiation work areas must be marked as such, with prominent “Radiation” or “Laser” signs on doors.
- Radwaste must be stored on-site in a limited access room until its activity has reached background levels, or until it can be transferred to the University’s radwaste storage at Bio21. Work only in approved rooms and areas (fume cupboards etc.). Avoid contaminating clean sites.
- Handle radioactive substances in plastic; avoid glass (could break)
- Report all spills immediately to your supervisor, no matter how minor
- Lasers must have shielding and interlock facilities appropriate for the type and class of laser
- Laser users must wear appropriate eye protection (laser goggles)

SAFE WORK PROCEDURES - Manual Handling

Manual handling includes any task requiring the use of a force exerted by a person to lift, push, pull or carry eg. pulling a lever, lifting an object, pushing or pulling a trolley etc. Manual handling incidents account for a considerable proportion of injuries to university staff and students. The weight of objects involved is often not a primary factor; actions such as reaching, twisting, bending and posture are often more important elements.

Any duties requiring repetitive and/or heavy manual handling should be assessed and documented by the supervisor, the person carrying out the task and one of the departmental personnel trained in manual handling assessments. This risk assessment is then used to determine how the task can be performed safely. It is important that training is provided and personnel performing such tasks carry out the work in accordance with their training. Any actions taken to control risk should be reviewed regularly.

SAFE WORK PROCEDURES -
Personal Protective Equipment (PPE) - Selection & Use

PPE is used where other control measures are not practical, or where PPE is used in conjunction with other control measures. Decisions on the use of PPE are based on formal risk assessment. Any PPE used must be suitable for the task and must be properly maintained; in most cases this will be the responsibility of the School, through its academic and work area supervisors. In laboratories, PPE requirements are determined by lab procedures, are provided by the laboratory, and relevant training must be provided by lab supervisors. All lab users must wear PPE as prescribed. PPE is also used during field work (boots, protective goggles, hat) and is usually prescribed in the pre-trip briefing notes. Field work participants are required to adhere to these requirements.

Gloves: When using chemicals, appropriate gloves are to be worn at all times. Disposable powder-free latex gloves are often a suitable option. For work with hydrofluoric acid, and for those with an allergy to latex, disposable powder-free nitrile gloves are recommended. A greater level of protection from both corrosive fluids and hot surfaces (<50%) is provided by reusable elbow-length gloves (rubber, neoprene, barrier, PVC). Many types of commonly used lab gloves are available through the School of Chemistry Store. Information on laboratory gloves can be found at www.ansell-edmont.com/download/Ansell_7thEditionChemicalResistanceGuide.pdf

Lab coats: Lab coats must be worn when working in the rock crushing, thin section, isotope geochemistry and hydrogeology labs, and for some applications in the fission track lab. In most cases, traditional, knee-length lab coats are available within those labs (e.g. rock crushing, thin section) but they can be quite dirty and/or may not be your size. Users wishing to purchase their own can do so in the Chemistry Store. In the isotope geochemistry labs, full-body coveralls are provided. Enquire with work area supervisor prior to starting work.

Safety Glasses/Goggles: Safety glasses must be worn in several laboratories (rock crushing, thin section, isotope geochemistry, hydrochemistry); special laser safety glasses are used when operating laser equipment. Enquire with work area supervisor prior to starting work. During field work, goggles must be worn when hammering rock. If you wish to purchase your own (e.g. for fieldwork), you can do so through the Chemistry Store.

Hearing protection: Ear muffs and/or ear plugs are required in several laboratories within the school (rock crushing, thin section, student thin section). Users of these labs are provided with ear muffs and disposable ear plugs. Information on ear muffs is available from any of the big safety gear supply houses, such as www.safetystuff.com.au. An Australian Standards compliant UVEX ear muff rated for 110dB is available from Chemstore. Disposable ear plugs, a low-cost and highly effective noise barrier alternative to ear muffs, are available from ChemStore.

Personal respirators: dust masks (personal respirator) must be worn when working in the rock crushing lab and in the student thin section work when using the rock saws. The respirator masks used are of the P2 type (have a breath-out valve to prevent the mask from clogging up with exhaled moisture). Do not use the more familiar P1 type masks (disposable white dust masks sold in hardware stores) as these are useless !!!. For more information, check www.safetystuff.com.au. Low-cost P2 personal respirators are available at ChemStore (ask for 'dust mask')

Hard Hats: Hard hats should be worn when there is a risk of objects falling from above. On many field sites (active quarries, mines), hard hats are mandatory. The School has a large number of hard hats for field work.

Footwear: Footwear should be appropriate for the particular hazards in the laboratory or field. **Open footwear must not be worn in the laboratory or whilst on field work**. All participants of scheduled field trips are required to supply and wear their own sturdy footwear. Steel capped boots (or at least very tough hiking boots) may be required for work in active quarries in mines and core sheds, and on drill rigs.

Inspection, maintenance and replacement: PPE should be inspected regularly, daily in some cases, or certainly during the 6-monthly work area self-audit process. Reviews of the need for and adequacy of PPE should be conducted simultaneously. All reviews will be in consultation with employees using the PPE.

Health Monitoring: Some activities involve noise, strong light and airborne dust hazards. Workers in those areas must wear appropriate PPE for protection of ears, eyes and lungs. The effectiveness of such risk control measures should be checked via health monitoring through the University's Occupational Health Service (eye tests, hearing tests, lung function tests).

Public areas: Laboratory coats, gloves and other protective clothing are not to be worn in amenities rooms. Gloves are not to be worn when coming into contact with public access areas such as the Store counter, stair handrails, door knobs, lift buttons etc, to avoid cross contamination.

SAFE WORK PROCEDURES - Motor Vehicles

The School of Earth Sciences operates several 4WD vans and a station wagon for use on university business by school staff and (postgrad-) students. All vehicles are equipped with cargo barriers, a Dry Chemical fire extinguisher and a first aid kit. In addition, 4WD vehicles have a snatch strap and rated shackles. Users of school vehicles are insured under normal university insurance provisions (see University Insurance Office, www.fpg.unimelb.edu.au/io/).

Staff and (postgrad-) students wishing to use a school car will need to obtain the necessary authorisation. The relevant forms and advise are available at Front Office, level 4. Costs for the use of school vehicles for research work purposes are charged to staff research accounts.

Online booking of school cars

Authorised users can make car bookings online. To use this facility, go to school website (www.earthsci.unimelb.edu.au) and click 'Staff Login'. Type in your id and password to access car booking menu. Passwords for the 'Staff Login' page are controlled by the School's IT Officer; contact Doug Morrison, x47307. School cars can also be booked directly through Front Office, level 4.

Driver Responsibilities

School vehicles must be driven in a safe and responsible manner. Drivers must obey road rules and conform to the requirements of the Melbourne University Transport Policy (www.unimelb.edu.au/unisec/pdf/transport_policy.pdf). Some of those requirements and rules are listed below; refer to Transport Policy website for further details.

- obey speed limits, traffic lights and parking regulations – if there are any fines, YOU pay them
- do not drive if working hours (INCLUDING DRIVING) could exceed 10 hours in a day, or 14 hours of driving in a 24 hour period.
- ensure there is a second driver in the vehicle in journeys longer than 5 hours. A 20 minute break must be taken after 3 hours. Where there are two drivers, it is recommended that a change of driver should take place every 3 hours
- driving while under the influence of drugs or alcohol, or while fatigued, is prohibited
- unauthorised passengers must not be carried (the use of official University vehicles is restricted to authorised users as defined in the University Transport Policy)
- defects in a vehicle must be reported immediately to the School Manager
- smoking is prohibited in all vehicles
- drivers must not use handheld mobile telephones while driving
- seatbelts must be worn at all times while driving
- leave the vehicle clean and tidy and with at least 3/4 tank of fuel. When leaving on field trips remember to check oil and water levels prior to leaving the University. Report any damage and malfunctions.
- the Log Book and Vehicle Driver Record must be filled in after each trip.

Accident

In the event of an accident resulting in serious personal injury or death, call police, a doctor or ambulance (emergency phone 000, works on landlines and mobile; in some cases, mobiles can use 112). Notify police if any personal injury or damage to property (e.g. cars) is involved. A police report is required to support any WorkCover claim. For comprehensive details about university procedures relating to accidents whilst on university business, see University Insurance Office, www.fpg.unimelb.edu.au/io/).

In the event of a collision with another vehicle, the following details must be obtained:

- full details of the other vehicle involved, including name and address of the driver, name and address of the owner (if different from driver), registration number, type of vehicle, extent of damage, name of insurance company
- name and address of any witnesses

Never admit any responsibility or liability

Circumstances of the accident must not be discussed with anyone other than authorised personnel, eg. Police.

All damage must be reported immediately to your Supervisor and School Manager.

Claims, letters of demand, writs, summonses or other legal correspondence received must immediately be forwarded unanswered to the School Manager who will then forward them to the University Insurance Office

Mechanical Problems

In the event of mechanical failure and/or breakdown, the vehicle must be removed from the road and secured. Unless you can fix the problem yourself, contact the RACV or equivalent interstate organization for roadside assistance (check tag on your car keys). If required, arrangements should be made to tow the vehicle to an authorised repairer if roadside repair is not possible. Contact School Manager or supervisor as soon as possible.

When travelling in remote areas, calling in help may be difficult, and any repair/towing could be very time-consuming and expensive. The best precautions against remote-area car problems are good trip planning & preparation, proper navigation and cautious driving. Having more than one vehicle is a good idea. Ensure car is mechanically sound, has plenty of fuel, water, oil, correct tyre pressure in all tyres, including spares. Ensure drivers have up-to-date 4WD training and know how to handle the conditions. In planning a remote area trip, always consider the possibility of road problems; ensure you know how to get out of sticky situations.

Use of private vehicles on University Business

The use of privately-owned vehicles on University business is discouraged.

The University will not accept any liability of whatsoever nature which may arise from use of private vehicles on University Business.

For further details regarding use of private vehicles, check Melbourne University Transport Policy (www.unimelb.edu.au/unisec/pdf/transport_policy.pdf).

SAFE WORK PROCEDURES - Off-campus work

Off-campus work includes fieldwork (guided excursions, geological mapping, taking measurements, collecting samples), attendance at conferences, visits to other universities or research facilities, off-campus seminars and student placements. To manage the considerable potential risks students and staff may be exposed to during off-campus activities, the University has developed an 'Off-campus work and travel policy' which can be viewed at http://www.pb.unimelb.edu.au/ehs/workplace_ehs/travel/

A guide to all relevant regulations and procedures, including insurance, student briefing and paperwork requirements, is available at www.science.unimelb.edu.au/about/compliance/offcampus. The key steps listed here are:

- when travelling overseas, look at the University Overseas Travel Policy; check relevant travel warnings
- for all other travel, check the Off-Campus Work Travel Policy, http://policy.unimelb.edu.au/UOM0330
- complete a risk assessment for all hazardous off-campus activities, using the 2D or 3D forms (http://safety.unimelb.edu.au/tools/risk/assessment/). For example, if driving is involved, consider what vehicles will be used, how driving duties will be shared, when rests stops should be taken ? If international students are involved, do they need extra information about specific hazards ? How much supervision will be required ? How many current First Aiders will be on the trip ? Do any participants have pre-existing medical conditions which should be known to organisers ? How will incidents and emergencies be handled ?
- conduct a pre-trip briefing, with briefing notes, which covers all relevant policy and insurance matters, details of risks and risk controls, details of incident and emergency management, and information on First Aid and issue resolution. If it is impractical to organise a briefing meeting, all necessary information should be supplied to participants by email. It is recommended to ask all participants to acknowledge receipt of the briefing material, by return email.
- conduct a pre-placement safety assessment for all off-campus student placements, such as at other research institutions, mines etc.; see http://safety.unimelb.edu.au/docs/placechklst.pdf for details
- obtain information on any vaccinations that may be needed well ahead of travel. Contact University Health Services for assistance if required.
- ensure you and your equipment are properly insured. Staff travelling on university business are usually covered by the University but there are exclusions and limitations. Students on an approved university trip are covered for travel within Australia but this is **not automatically the case** for overseas travel. Contact the University Insurance Office for assistance (www.fpg.unimelb.edu.au/io/). Claims for loss or damage to equipment taken on off-campus trips must be supported by admissible documentation, such as a departmental register of equipment (any value) taken off-campus; items values at >$5000 taken on off-campus trips must be registered with the Insurance Office. The most common claims involve laptop computers.

HR18, TravelPortal, travel diary and expense claims

Off-campus work for 1 day or less is straightforward, requiring little by way of paperwork. However, staff and students planning to work off-campus for 1 day or less should inform and seek permission from their supervisor before leaving, go through the usual on-line booking process if they wish to use a departmental vehicle, and ensure any costs will be covered. Further details are available in the section on Fieldwork, see below.

Off-campus work that involves 1 or more overnight stays requires formal approval from the supervisor. Until recently, this approval process involved pre-trip completion of the HR18 travel form (compiles personal details, travel itinerary, source of funding and contact details while away). **As of late 2010, off-campus work approvals are handled through TravelPortal**, the University's online travel booking system. Rather than filling in a HR18, staff now enter the same details at TravelPortal. If all goes well (and good luck with that), TravelPortal users should be able to create a travel requisition number, obtain supervisor approvals, travel quotes, book online, attach documents, complete travel diaries, risk assessments and run reports. TravelPortal users should be able to use the system for their formalities even if they do all their own travel arrangements and/or do not use university funds.

For information about TravelPortal visit http://unimelb.edu.au/travel and go to the Help menu. For questions about TravelPortal that are not covered on the website (e.g. FAQ section), and for training session details, contact travel-enquiries@unimelb.edu.au.

A travel diary needs to be completed and submitted post-trip for all international travel and for domestic travel of >5 days. As of late 2010, travel diaries are completed within TravelPortal.

Expense claims for costs associated with travel on university business (e.g. hotel, transfers, food) can be made post-trip and must be supported by original receipts. This is still done by handing in the relevant form in hardcopy, with the receipts (employee expense claim, see Front Office). See Helen Russell for advise.

Fieldwork

Fieldwork is a major component of earth sciences teaching and research. It is also potentially hazardous business. Fieldwork usually involves travel, sometimes off-road, and a wide range of other activities with risks that can be difficult to control. The best way to approach fieldwork safety is sound planning, including assessment of risk and planning of risk control measures. For this reason, the School has set out a standard procedure to be followed in the lead-up to all field trips.

What to do before going on a field trip

All field trips, big or small, should be preceded by the same formal steps:

1. complete Earth Sciences Medical Questionnaire (available for download at school website) and hand in to Front Office. While personal information given on this form is kept confidential, field trip organisers need to be aware of any medical conditionsamong participants that may affect trip logistics and itinerary, such as dietary, disabilities, allergies etc..

2. complete the Field Trip Details form (available for download at school EHS webpage). This form compiles details on planned itinerary, driver details, contacts and emergency arrangements, list of participants and a risk assessment (see below). Hand in to Front Office.

3. book cars and field First Aid kits as required

4. provide trip participants with all necessary information about the trip, in a meeting or by email (pre-trip briefing)

Fieldwork risk assessment

A list of common hazards encountered in fieldwork in Australia is given below. Risks to health, property and environment associated with each of these hazards can be quantified – as high, medium or low – by numerically rating the exposure, likelihood and potential consequence of each identified hazard. Based on the risk ratings, suitable control measures may need to be put in place; these fall in the general categories of elimination, substitution, engineering, administrative, or personal protective equipment.

When making a fieldwork plan, you should compile - in writing - the likely hazards of the fieldwork program, using the list below, perhaps extended to suit the circumstances. In the case of students and postdoctoral students, the supervisor should be involved in this procedure. For quantification of risk, refer to the table overleaf to get numerical quantifiers for exposure, likelihood and consequence and enter your estimates in the relevant boxes. This is a so-called 3D risk assessment process (there is also a 2D one which rates only likelihood and consequence). All risk assessments across the university must be done using standard procedure, see http://safety.unimelb.edu.au/tools/risk/assessment/.

Common fieldwork hazards and risk rating

Hazard	Exposure	Likelihood	Consequence	Risk Assessment (ExLxC)
Lost personnel				
Rock faces				
Bushfire				
Foreshore areas				
Snake bite				
Exposure				
Injuries				
Traffic accident				
Vehicle breakdown				
Medical				
Chemicals				

Once the risk assessment has been done, the (E x L x C) product scores can be compared with the numerical ranges for low, medium, high and very high risk, and risk control measures can be designed to bring down the risk scores. Repeat the assessment to check if the risk control measures are likely to do the job. **Example:** geological mapping in fire-prone bush on a day of total fire ban would reasonably attract a total risk rating of 450 (E=3, L=3, C=50), i.e. High.

This is an unacceptably high risk level. The most effective control measure in this case would be elimination - to not go out on such days. This would drop the L factor from 3 to 0.1, and reduce the total risk rating from 450 to 15, comfortably in the Low Risk zone. Frequently offered training sessions on Risk Management, Incident Response and Investigation are mandatory for all academic supervisors and for those in a supervisory role (e.g. lab managers, field trip organisers). For session dates and venues check Themis Self Help (Training and Development/browse by category/EHS) or contact School EHS officer.

Rating risks (from http://safety.unimelb.edu.au/docs/TRA_3_Variable.pdf)

Exposure (E)		Likelihood (L)		Consequence (C)		Risk Score (ExLxC)
continuously, many times daily	10	Almost certain – the most likely outcome	10	Catastrophic, multiple fatalities, permanent extensive environmental damage	100	**>600 very high** **300-599 high** **90-299 medium** **<90 low**
Frequently, once daily	6	Not unusual – perhaps 50:50 chance	6	Disaster, fatality, permanent, local damage to environment	50	
Occasionally, once per week or month	3	Unusual but possible – e.g. 1 in 10	3	Very serious, permanent disability/ill health, non-permanent environmental damage	25	
Infrequent, once a month or once a year	2	Remotely possible - e.g. 1 in 100	1	Serious, non-permanent injury or ill health, adverse effect on environment	15	
Rare, has been known to occur	1	Conceivable – has never happened in years of exposure, e.g. 1 in 1000	0.5	Important, medical attention needed, off-site emission but no damage	5	
Very rare, not known to have occurred	0.5	Practically impossible – not to knowledge ever happened anywhere, e.g. 1 in 10000	0.1	Noticeable, minor cuts/bruises or sickness, small loss of containment, no off-site consequences	1	

Example of risk control measures in fieldwork

- **Lost personnel:** Roll call before leaving area. Ensure roll-call at regular, strategic times. Maps of area provided. Briefing prior to field work.

- **Rock Faces:** Seek alternative, less hazardous outcrop. If working a high rock face is unavoidable, always approach with caution, checking to see if loose rocks may fall. It is a good idea to have somebody looking out for rock movement to warn those working near the rock face. Do not attempt to climb rock faces or cliffs. Do not stand near the edge of significant vertical drops as the edge may give way. Never drop rocks or any other objects over a cliff. Watch out for others in the field party.

- **Bushfire:** Only light a campfire when it is safe to do so. Keep a close eye on the fire and keep it under control; ensure fire is properly put out. Observe fire bans. Provide itinerary to relevant park ranger when entering a fireprone area during the fire season. Be aware of scheduled fuel reduction burns which are done outside the regular fire season. Monitor weather conditions daily. Do not allow smoking in the field. Staff should be familiar with area. Avoid field trips on days of total fire ban. Check with CFA (1800 240 667) or visit the Dept of Sutainability & Environment's (DSE) 'Fire and other Emergencies' info page (www.dse.vic.gov.au).

- **Foreshore Areas:** Check tide times prior to field work. Take extreme care in intertidal zones and remain vigilant of the swell. In addition, beware of loose rock faces when working below cliffs (See 'Rock Faces' above).

- **Snake bite:** Be aware of where and when snakes are particularly active; avoid moving in such areas and at such times wherever possible (October-May in Victoria, usually along water, but brown snakes can often be found on drier ground). Watch your step, in particular when crossing over logs. Have adequate number of current first aiders. Ensure all participants are briefed on first aid for snake bite (compression bandage, keep casualty quiet, do not wipe bite site, seek medical attention asap). A field first aid kit should be available in at least one of the vehicles, and small hiker's kits (and extra compression bandages) carried in field.

- **Exposure:** Be aware of likely weather conditions. Participants to be advised about appropriate clothing before trip. In hot, sunny weather, bring hat, wear long-sleeved shirt, sunglasses, use sunscreen and take plenty of drinking water. In the mountains, be prepared for any kind of weather and sudden changes. Monitor weather conditions daily.

- **Injuries:** The most common injuries in fieldwork situations are cuts, bruises, rolled ankles, allergic reactions to local plants/animals and, occasionally broken limbs. Blisters and insect bites can also be a nuisance. Major injury is probably best avoided by moving carefully and thoughtfully. Good sturdy footwear (comfortable hiking boots) is a must in rugged conditions. Every trip must have access to at least one field first aid kits; small hiker's kits should be carried by each participant while working away from vehicles. Wear appropriate PPE (hard hats) in areas where there is a risk of rock falls.

- **Bus accident:** All passengers are required to wear seatbelts if installed.

- **Vehicle accident:** see earlier comments under Motor Vehicles. Where off-road travel is required in a four-wheel drive vehicle, the driver must be able to demonstrate four-wheel drive experience to the satisfaction of the supervisor or undertake a four-wheel drive training course (the School of Earth Sciences arranges such training every year) before the vehicle is used. First aid kits are kept in each Earth Science vehicle. Organise rendezvous points or contact times.

- **Vehicle breakdown:** Ensure vehicle is well-prepared, see comments under Motor Vehicles (few pages above). Organise rendezvous points and times. Earth Science vehicles have RACV membership; this entitles us to roadside assistance from RACV equivalents in all other states and territories.

- **Medical:** Ensure any pre-existing medical conditions that might affect a participant's condition during field work are known and assessed prior to the trip; take precautions if needed. Field trip participants are required to complete the Medical Information & Authorisation form (available at Front Office) and hand it in to Front Office or the trip coordinator prior to the trip.

- **Chemicals:** hazardous substances (chemicals, compressed gases) carried by a field party pose risks to personal safety and to the environment. For this reason, they must be transported and handled in a safe manner, in accordance with Dangerous Goods (Transport) Regulations 1987. Chemicals should be packed to ensure segregation, with protection (to people and the environment) from spills in the case of an accident. Copies of Material Safety Data Sheets should be taken with the chemicals, and any special requirements considered in your risk assessment. **Waste** - Bring all hazardous waste back to the University for disposal, especially chemicals. Do not allow any hazardous waste to enter watercourses and do not bury any waste. **Spills** - Take all possible care to avoid spills of hazardous materials (especially fuel).

- **Park Permits:** Obtain a permit (if required) before entering state forests, national parks or crown land. Read and comply with the conditions of these permits.
- **Land Disturbance:** Do not disturb land in a way which may lead to degradation. If disturbance is unavoidable, repair the disturbance. Respect private property and sites of historical significance (e.g. sacred sites)
- **Flora & Fauna:** Avoid disturbance of natural flora or fauna
- **Mud and Soil:** Remove mud and soil from boots, equipment and vehicles before starting or returning from field trips (to reduce likelihood of spread of fungi, weeds and bacteria).
- **Relics:** Do not excavate or remove archaeological and aboriginal relics without a relevant permit. If in doubt, leave that relic alone.

Other aspects of fieldwork planning

Participants

Fieldwork should always be conducted in groups of two or more. All members of a field party must be listed in the fieldwork plan and must complete the medical questionnaire (see "Field Trip Details" appendix); copies of these documents must be left with the Main Office.

Safety / First Aid Requirements

At least one First Aider (trained to level 2) must be available for any larger group field excursion. For this reason, academic supervisors involved in field camps, teaching excursions and/or ongoing field-based research/teaching have current level 2 First Aider training. A list of the School's current First Aiders can be found on p.6 of this manual.

Provision of First Aid for smaller fieldwork parties (as small as two, or even one) is a less straightforward issue. Many staff have had First Aid training at some stage but are not currently qualified (last 3 years). First Aid training (level 1, 1 day) is provided to each cohort of Geology Honours and MSc students (paid for by School), and some of those move on to do PhD projects, i.e. we have a small number of PhD students who are current First Aiders. There is at present no provision for mandatory First Aid (level 2/3) training for all PhD students and postdoctoral students whose research involves fieldwork. For this reason, unless a party includes a staff member who is a current First Aider, there is no guarantee that anybody in the party holds a current First Aid certificate. Planning for fieldwork involving small parties

should take this into account. For example, if a PhD project involves regular field trips, a 2-3 day First Aid course would be a sensible investment. Likewise, staff whose First Aid training has expired and who expect to do fieldwork may want to do a Level 2 refresher. A level 2 (senior) First Aid course takes 2 days and costs around $200; a level 2 refresher takes 1.5 days. Level 3 training (occupational First Aid) takes 3 days and costs ~$500. St John Ambulance offer a 2-day module called 'Remote First Aid" (prerequisite is level 2) which would seem to be ideal for a fieldwork situation (see www.stjohn.org.au/). There are many providers of First Aid training in the Melbourne area. In some circumstances, costs for First Aid training may be covered by the School, at the discretion of School Management.

Field parties have access to the School's Field First Aid kits (orange cases). They are stored opposite room 412 (H Russell's office) and need to be signed out (contact Front Office staff well ahead of departure). The kits are restocked during regular 3 monthly First Aid kit checks. However, each kit taken out should be checked by a field trip participant prior to the trip, to avoid surprises (the kit may be strongly depleted after a recent trip). In addition, field trip participants should notify Front Office if there is an urgent need of restocking the kits after a trip. If necessary, restock locally during the field trip (keep receipts for reimbursement) when there is an opportunity to do so (pharmacies, supermarkets, petrol stations). Suitable vehicle spares and survival equipment should also be considered. Safety is everyone's responsibility..

Proposed itinerary, communication and emergency contacts

The 'Field Trip Details' form you fill out for all field trips will contain information on estimated times of departure, arrival at sites and time of return, and the names of all people involved in trip. It's a good idea to append a map showing location of field sites. Proposed Itineraries and Risk Assessments should be copied and left with the Main Office. The originals should be taken with you. Participants must be briefed on communication lines and schedules at the start of the field trip. Communication and work schedules are essential items. Ensure there is a procedure if reporting deadlines are not met.

If a mobile phone is used during the trip, a check should be made to ensure coverage in the area; remember that topography may affect service in remote locations. Satellite phones, mobile phones, UHF radios and EPIRBs may be borrowed from Main Office.

A list of emergency contact telephone numbers should be compiled for all participants involved in fieldwork. This list should be adjusted to the activities and the location of the field trip.

APPENDIX - Further Information

University EHS Manual

The University EHS Manual is on-line at:

www.pb.unimelb.edu.au/ehs/ehs/ehsm.php3

EHS Resources – Front Office

Copies of the following are kept in the Front Office (Rm 401):

Occupational Health and Safety (Hazardous Substances) Regulations 1999
Victorian Dangerous Goods (Storage and Handling) Regulations 1989.
Victorian Dangerous Goods (Prescribed List) Regulations 1986.
Australian Standards 2243 Safety In Laboratories Parts 1-10

Environmental Health & Safety Notice Board

The EHS Notice Board is located in the Tea Room (room 404) on level 4

Emergency Information Posters

These are located on each floor in the main stairway. They identify the fire escapes, fire extinguishers, first aid cabinets, Emergency Floor Wardens, and First Aiders for the relevant floor.

Material Safety Data Sheets On-Line: the ChemFFx data-base

ChemFFx is a database of Material Safety Data Sheets (MSDS) accessible to staff and students, as long as access is from a computer on campus. It is a very useful tool to find MSDS's from original (vendor) sources and compiled by FFx. The former are useful for uncommon chemicals and for proprietary products. The FFx-compiled MSDS's are good for anything else; the user can choose between mini, short and long. FFx MSDS's have the further advantage that they carry the data they have been compiled for the user, i.e. they do not need to be replaced for another 5 years. FFx can also be used to print out labels for hazardous chemicals. FFx is part of – but separate from – the university's ChemGold III software package, a comprehensive chemical inventory and manifest managing tool.

Access FFX on

http://safety.unimelb.edu.au/unimelb-only/chemffx.html

To log-in, enter your normal email username and password. If program does not load properly, or is slow, you may need to disable your browser's pop-up blocker. Check the how-to pdf's on the log-in page for advise on how to find and print MSDS's and labels

On the left of screen you find 5 buttons that are used to select a ChemGold MSDS (short/long), a mini MSDS (very good) or a Vendors MSDS. The other two buttons select Labels and Emergency procedures.

Example: click Gold MSDS Short and type methanol in the 'Name/Cas No." field; click Go. After a few seconds, a short MSDS for methanol appears which can be printed out or emailed. If you are after a methanol MSDS from a particular manufacturer, clear the field, press, Vendors MSDS and try again; this should bring up a list MSDS's from different makers.

More details on how to use FFx, see pdf's on Log-in screen and FFx Help

Another good source of MSDS's is http://ccinfoweb.ccohs.ca/ maintained by the OHS Canada

Appendix - Field Trip details

Original should be taken on trip. Copies to be lodged with Main Office & person nominated on this page

Vehicle Copies Made ☐ *Copy Lodged With Main Office* ☐

Destination: .....

Departure Date & Time: .....

Return Date & Time: .....

Vehicles

Registration	Driver 1	Driver 2*	Driver 3*

*Nominate additional drivers if driving time is greater than 5 hours

Communications

Type (Sat Ph/Mobile/UHF Radio)	Mobile Number	Who has it?

Proposed itinerary

A copy of the itinerary must be attached to this sheet. Include estimated times of departure, arrival at sites, en-route rendezvous points, and time of return. A map(s) should be provided showing location of field sites.

Appendix – Fieldtrip Plan – return details

Copies to be lodged with Main Office & person nominated on this page 'Communication on Return'
Original should be taken on trip.

Communication on Return

On return from the field trip as specified on the previous page, the following person/s will be contacted.

Name: .....

Address: .....

Telephone: .....

Mobile: .....

Deadline Failure

If contact is not made by the specified time, the procedures below should be followed:

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Emergency Contact Numbers

Police, Fire, Ambulance	000
Police Search and Rescue Squad	(03) 9537 1006
Outside Metropolitan area (Freecall)	1800 815 257
Water Police / Rescue Coordination Centre	9534 7361
Victorian State Emergency Services	(03) 9696 6111
Poisons Information	13 11 26
CFA Fire Restriction Information	13 15 99
Melbourne University Security	(03) 8344 6666
School of Earth Sciences	(03) 8344 7675

Appendix – Fieldtrip Details - Participants

Copies to be lodged with Main Office & person nominated on previous page 'Communication on Return'. Original should be taken on trip.

Please list all staff & students attending. Add extra pages if required. All participants should complete a 'Medical Questionnaire & Authorisation' (Original should be taken on trip). First aiders should be identified.

Name	Staff / Student Number	Medical Q/s*

*Medical Questionnaire with emergency contact information has been completed.

Appendix – Fieldtrip Risk Assessment

Copies to be lodged with Main Office. Original should be taken on trip.

Strike out or add other identified hazards where applicable.

Hazard	E	P	C	ExPxC
1. Lost personnel				
2. Bushfire				
3. Snake bite				
4. Weather				
5. Injuries				
6. Vehicle accident				
7. Vehicle breakdown				
8. Medical				
9. Chemicals				
10. Rock faces				
11. Hammering				
12. Mines				
13. Other				

Appendix – Fieldtrip Details
Risk Assessment

Rating the Risks

Exposure (E)		Likelihood (L)		Consequence (C)		Risk Score (ExLxC)
continuously, many times daily	10	Almost certain – the most likely outcome	10	Catastrophic, multiple fatalities, permanent extensive environmental damage	100	**>600 very high** **300-599 high** **90-299 medium** **<90 low**
Frequently, once daily	6	Not unusual – perhaps 50:50 chance	6	Disaster, fatality, permanent, local damage to environment	50	
Occasionally, once per week or month	3	Unusual but possible – e.g. 1 in 10	3	Very serious, permanent disability/ill health, non-permanent environmental damage	25	
Infrequent, once a month or once a year	2	Remotely possible - e.g. 1 in 100	1	Serious, non-permanent injury or ill health, adverse effect on environment	15	
Rare, has been known to occur	1	Conceivable – has never happened in years of exposure, e.g. 1 in 1000	0.5	Important, medical attention needed, off-site emission but no damage	5	
Very rare, not known to have occurred	0.5	Practically impossible – not to knowledge ever happened anywhere, e.g. 1 in 10000	0.1	Noticeable, minor cuts/bruises or sickness, small loss of containment, no off-site consequences	1	

1. Lost personnel: Roll call before leaving area. Ensure roll-call at regular, strategic times. Maps of area provided. Briefing prior to field work. Remain in close communication with others at all times. Always work in groups of 2 or more.

2. Bushfire: Only light a campfire when it is safe to do so. Keep a close eye on the fire and keep it under control; ensure fire is properly put out. Observe fire bans. Provide itinerary to relevant park ranger when entering a fireprone area during the fire season. Be aware of scheduled fuel reduction burns which are done outside the regular fire season. Monitor weather conditions daily. Do not allow smoking in the field. Staff should be familiar with area. Avoid field trips on days of total fire ban. Check with CFA (1800 240 667) or Dept of Sutainability & Environment (DSE) Fire and other Emergencies info page at www.dse.vic.gov.au.

3. Snake bite: Be aware of where and when snakes are particularly active; avoid moving in such areas and at such times wherever possible (usually along water, October-May in Victoria). Watch your step, in particular when crossing over logs. Have adequate number of current first aiders. Ensure all participants are briefed on first aid for snake bite (compression bandage, keep casualty quiet, do not wipe bite site, seek medical attention asap). Field first aid kits in all vehicles, small Hiker's kits (and extra compression bandages) carried in field.

4. Weather: Be aware of likely weather conditions. Participants to be advised about appropriate clothing before trip. Boots with ankle support mandatory; supervisors may not allow people in sandals or thongs off the bus. In hot, sunny weather, bring hat, wear long-sleeved shirt, use sunscreen and take plenty of drinking water. Recommend sunglasses are worn. In the mountains, be prepared for any kind of weather and sudden changes. Monitor weather conditions daily. Field first aid kits in all vehicles.

5. Injuries: The most common injuries in fieldwork situations are cuts, bruises, rolled ankles, allergic reactions to local plants/animals and, occasionally broken limbs. Blisters and mossie bites can also be a nuisance. Major injury is probably best avoided by moving carefully and thoughtfully. Good sturdy footwear (comfortable hiking boots) is a must in rugged conditions. Field first aid kits in all vehicles, small Hiker's kits carried in field. Wear appropriate PPE (hard hats) in areas where there is a risk of rock falls.

6. Vehicle accident: Rental minibuses should have seatbelts. Organise rendezvous points or contact times en route. First Aid kits in vehicles.

7. Vehicle breakdown: Ensure vehicle is well-prepared (oil, water, air pressure, pumped spares, car in good condition). Organise rendezvous points and times. Earth Science vehicles have RACV membership; this entitles us to roadside assistance from RACV equivalents in all other states and territories.

8. Medical: Ensure any medical conditions are assessed. Medical Information and Authorisation Form (available Front Office or School website). Completed and lodged with Main Office and trip leader. Any necessary precautions should be taken prior to trip.

9. Chemicals: hazardous substances (chemicals, compressed gases) must be carried in a safe manner, following the Australian Dangerous Goods Code 6. Chemicals should be packed to ensure segregation, with protection (to people and the environment) from spills in the case of an accident. Copies of Material Safety Data Sheets should be taken with the chemicals, and any special requirements considered in your risk assessment. **Waste** - Bring all hazardous waste back to the University for disposal, especially chemicals. Do not allow any hazardous waste to enter watercourses and do not bury any waste. **Spills** - Take all possible care to avoid spills of hazardous materials (especially fuel).

10. Rock Faces/Coastal Outcrops Seek alternative, less dangerous outcrop if possible. Do not climb rock faces or throw rocks or objects over cliffs. Stay well back from cliff edges as the edge may give way. When approaching a rock face, always look up to check if there are loose rocks which could fall. Exercise great care in shoreline areas when there is a swell. Wear hard hats.

11. Hammering Only use a geological hammer for hammering in the field. Ordinary hammers can fragment and injure yourself and others. Wear safety glasses. Exercise care near others.

12. Mines Only enter mines under the direct supervision of the mine operator.

13. Other

Appendix – Fieldtrip Details Checklist

Checklist	
Students have been:	
Given Student Manuals or Handouts (with maps of area)	
Returned Medical information and authorisation form, signed	
Briefed on appropriate behaviour when on field trips.	
Demonstrating staff have been:	
Given Student Manuals or Handouts	
Given site maps and locations	
Briefed on appropriate behaviour when driving & whilst employed on field trips.	
Briefed on rendezvous points en-route or contact schedules.	
Supervisor has:	
List of participants (including all staff & students).	
Medical information and authorisation form, for all staff & students	
Lodged copies of Itinerary to Main Office	
Lodged copies of Participant List to Main Office	
Lodged copies of Medical Questionnaires to Main Office	
Briefed students on appropriate behaviour when on field trips.	
Briefed demonstrators on appropriate behaviour whilst employed on field trips.	
Briefed drivers on rendezvous points en-route or contact schedules.	
Equipment:	
Field first aid kit/s (Field store)	
Hard hats (Field store)	
High visibility vests (Field store)	
Safety glasses (Field store)	
Satellite Phone/s (Main Office)	
Mobile Phone/s (Main Office)	
Emergency Positioning Indicating Beacon, EPIRB (Main Office)	