The University of Nottingham

School of Geography

Safety Policy Handbook

Version 3:
January 2007

Table of Contents

Part 1. General Procedures

1.1 Statement of Intent

The policy of the School of Geography is to attain and maintain the highest standard of safety within the working environment that is reasonable and practicable to achieve. The objective of this policy is to ensure the health, safety and welfare of the School's staff, students and visitors. All members of staff and students are expected to co-operate in achieving this objective by observing the rules and procedures and by following the advice given in this document.

The Head of School is ultimately responsible for the adequacy and effectiveness of the School's arrangements for health and safety. He is assisted in performing the duties associated with these responsibilities by the School Safety Officer. Safety policy and safety issues are discussed by the School Safety Committee and this comprises representatives of all interest groups. Any member of the committee may be approached to raise particular safety issues. A meeting of this Safety Committee is held on a termly basis and the School Safety Officer reports to Staff Meetings.

All members of staff and students are responsible for their own safety and the safety of others. Academic and supervisory staff conduct those activities over which they have control in a safe manner and in accordance with University and School policies and procedures. They will co-operate with the Head of School so that responsibilities at that level can be discharged. Assessment of work-related risks is a key part of managing the School's safety.

1.2 Premises to which this statement applies

Concern for health and safety in the School extends to all areas in which the business of the School is carried out. Areas and locations covered include the Economics and Geography Building in addition to the locations of any organised visits and fieldwork activities outside the School. Where applicable, such visits will be subject to the rules and procedures of the receiving organisation.

1.3 Familiarisation with this statement: induction training

All personnel must make themselves aware of the contents of this policy statement. All new personnel are required to read the statement and complete the *New Starter Health and Safety Induction Questionnaire*. Formal induction sessions are held for all undergraduates and taught Masters students at the beginning of each autumn semester and for new postgraduates and staff on a termly basis. These sessions are organised and run by the Deputy Safety Officer in order to aid completion of the questionnaire and provide an open question and answer session to aid understanding of School and University policies and procedures. Formal records are kept of these training sessions.

All unaccompanied visitors to the School are required to report to the School Office (see section 1.5.8). They will then be transferred to the care of another member of staff who will ensure that they are familiar with the relevant parts of this statement. Visitors must not enter the workshop or the laboratories unless accompanied by a competent member of staff able to identify the hazards associated with these areas.

1.4 Authorised members of staff

The following section outlines the members of staff responsible for ensuring compliance with School and University policies and procedures.

School Safety Committee:		ext no.
Head of School	Prof Charles Watkins	15439
School Safety Officer	Prof Michèle Clarke	15446
Deputy Safety Officer	Mr Ian Conway	15499
School Administrator	Mrs Rosemary Hoole	15454
Director of Undergraduate Studies	Dr Robert Dugdale	15437
Director of Graduate Studies	Prof Andrew Leyshon	66147
Director of Research	Prof Sarah O'Hara	14381
Disability Liaison Officer	Dr Richard Field	66146

Members of Staff with particular knowledge of or special competence in the following areas:

(a) Specific duties:

Radiation Protection Supervisor:	Prof Michèle Clarke
Display Screen Equipment:	Ms Elaine Watts, Prof Michèle Clarke
Manual Handling:	Mr Ian Conway
Electrical Safety Testing:	Mr Ian Conway, Mr Graham Morris, Ms Teresa Needham
Laser Supervisor:	Prof Michèle Clarke
Legionella Prevention Management:	Mr Graham Morris

(b) Specific Equipment:

Vehicle hire and maintenance:	Mr Ian Conway, Mr John Love, Ms Louise McIntyre
Reprographics:	Ms Elaine Watts
Workshop:	Mr Ian Conway
Cryogenic vessels:	Prof Michèle Clarke, Mr Graham Morris, Mr Ian Conway
Pressurised gas cage:	Prof Michèle Clarke, Mr Graham Morris
Water tanks and baths:	Mr Graham Morris

(c) Laboratory Areas:

CAM King Laboratory:	Mr Graham Morris, Ms Teresa Needham
HH Swinnerton Laboratory:	Mr Graham Morris, Ms Teresa Needham
Environmental Change Laboratory:	Prof Michèle Clarke, Mr Graham Morris, Ms Teresa Needham
Graduate Computer Laboratory:	Mr Chris Bates, Mr John Milner
David Ebdon Computer Laboratory:	Mr Chris Bates, Mr John Milner

1.4.1 Critical Incident Management and Disaster Recovery

The School has a Critical Incident Management and Disaster Recovery plan a copy of which is kept in the School Office A1, along with an emergency call out list and telephone numbers of key School personnel. In addition University Security have copies on file. All school staff on the list are aware of this procedure.

1.5 General Advice, Rules and Procedures

This section deals with the system for reporting hazards, risk assessment and emergency procedures**.**

1.5.1 System for reporting hazards

All members of staff are responsible for their safety and the safety of others. Students are expected to always act in a sensible and safe manner. It is not acceptable to condone unsafe working conditions or practices by ignoring them. As individual School members, you must advise those carrying out unsafe practices to desist or help put right unsafe practices if it is within your competence to do. All incidences of unsafe working must be reported to the School Safety Officer (SSO) so that future action to avoid such occurrences can be taken. All hazards should be also be reported to the School Safety Officer. An online hazard report form is available in the University Safety Office web page, for reporting hazards on University premises.

1.5.2 Risk Assessment

Risk assessment underpins safety management within the School. Formal risk assessments are required for a range of School activities such as laboratory work, workshop activities, fieldwork, use of reprographic equipment and postgraduate research. Completed risk assessments are held by the School Safety Officer. Generic risk assessment forms are available from the School Safety Officer, the School Office and in downloadable format from the School of Geography web page. In addition, risk assessment forms an integral part of the benchmarking standards in geography teaching & learning and, as such, students are encouraged to perform risk assessments for specific tasks as part of their geographical training.

1.5.3 Fire and Emergency Procedures

The fire alarm in the Sir Clive Granger Building is a continuous siren.

All members of the School must ensure that they know the positions of the nearest fire alarm call point, internal and external telephones, fire extinguishers and exit routes. The Sir Clive Granger Building is fitted with an Automatic Fire Alarm (AFA) system. This system uses smoke and heat detectors to automatically operate electronic sirens within the building and send a signal to Trent Security Control Room, who are responsible for calling the Fire Brigade. Manual Break Glass Points may also be used to trigger the alarm.

Due to the sensitivity of the detectors used in the AFA system, there is the potential for an Unwanted Fire Signal which may be actuated by cigarette smoke, dust, spray polish etc. In order to reduce the number of times that the Fire Brigade are called to unwanted fire signals, during normal office hours (08.00-18.00hrs) there will be a delay of **five minutes** following the automatic tripping of the alarm, before the Fire Brigade is called. This is to enable the cause of the fire to be investigated.

Trent Security will immediately respond to an automatic alarm and mobilise a guard to the building affected, to establish the cause of the alarm and report back. If there is no response within five minutes, the Fire Brigade will be called. The Building Fire Supervisor, Mr Ian Conway, or one of his deputies (see below) is also responsible for investigating the cause of any automatic activation of the system within the building and should notify Trent Security of the cause once this has been established.

On discovering a fire

- If the AFA has not already been triggered, activate the alarm by operating the nearest glass call point
- Dial 8888 via the nearest internal telephone and state location of the fire. If Trent Security cannot be contacted dial 999.
- Use appropriate extinguishers if safe to do so and your escape route is clear
- Evacuate the building ensuring, if possible, that all doors are closed but not locked

On hearing the fire alarm

On hearing the fire siren:

- Close all doors and windows
- In laboratories, turn off and/or make safe all experiments
- Immediately evacuate the building by the nearest available exit
- Do not use lifts or stop to collect personal belongings
- Report to the assembly point in the Visitors Car Park at the rear of the building
- Do not re-enter the building until instructed by the Senior Fire Brigade Officer that it is safe to do so (in the event of a drill, this rôle will be taken by the Evacuation Co-ordinator).

The Sir Clive Granger Building uses the Fire Token System. All staff and postgraduates in the School are formally trained in how to operate the Fire Token Evacuation Procedure. With this procedure, the first member of staff to arrive at a Fire Token removes it and, following the route specified on the token, checks the rooms to ensure that everyone has left. The token is then taken to the Assembly Point and handed to the Evacuation Co-ordinator, who will be identifiable by wearing a "luminous" jacket. The Evacuation Co-ordinator will collect all tokens and liaise with the Fire Brigade.

The fire alarm system is tested each week at 08:10 on Tuesday by the Estate Office. A fire drill to test the School's procedures will be held at least annually.

The Fire Supervisor for the School and the Building is Ian Conway. In his absence, one of the deputy Building Fire Officers (Mick Vickers, Porter; Prof Michèle Clarke, Geography) will assume the rôle.

1.5.4 Accidents and First Aid

If serious injury is suspected dial 8888 to summon an ambulance. If the Fire Brigade or Ambulance is needed state clearly where the service is required and also give your name. To prevent misunderstanding, ask for the message to be read back.

If First Aid is required summon help from the nearest First Aider (see section 1.5.4). First Aid Boxes are kept in the CAM King Laboratory (B28), the HH Swinneron Laboratory (A30), Workshop (A30a), Cartographic Unit (A35), David Ebdon Laboratory (B29) and in the corridor outside the School Office (A1). The B29 and A1 First Aid boxes are accessible outside of normal working hours. The contents of the First Aid boxes have been stipulated by the Occupational Heath Unit. It is a serious offence to misuse or misapply any first aid item. First Aid supplies for the boxes are maintained by the Deputy SSO, Mr Ian Conway, and any use of first aid supplies should be immediately reported to him.

All accidents, however minor, must be reported to the School Safety Officer. Certain serious accidents must be reported to the University Safety Officer under the reporting of injuries and dangerous occurrences regulations (RIDDOR; see *University*

Safety Policy P5/96B), particularly if they result in a period of absence from the University.

1.5.4.1 Staff Trained in First Aid in the School:
It is School policy that all staff should be trained in First Aid, especially where they are involved in fieldcourses. A list of current School first aiders can be found in Appendix II.

1.5.5 Telephones for Emergency Use
Internal telephones are located in the ground floor foyer area, all academic offices, laboratories and some lecture rooms. Dial 8888 to seek emergency assistance.

1.5.6 Working Practices
Everyone has a responsibility to ensure that health and safety policies and procedures are adhered to. The University No Smoking Policy which came in to force on the 1st September 2006 states in section 2 (1) that smoking is permitted in open areas away from entrances, windows and other openings into University buildings. Section 2 (2) also states that the bins provided at the approach to building entrances are there for the safe and responsible extinguishing of cigarettes before entering the building and not an indication that smoking is permitted in building entrances.

Smoking is forbidden on the fire escapes and immediately outside of the rear of the building near the HH Swinnerton Laboratory and outside the lecture room air ducts. No Smoking notices are posted in these locations. Persons under the influence of alcohol (see University Alcohol and Drugs Policy, P3/95A) are forbidden to work in laboratories, workshops or with machinery. University regulations also forbid approved drivers from driving minibuses less than 8 hours after alcohol consumption (Safety Office Circular P12/99A). Stress is an adverse reaction displayed by a person to excessive pressures and demands placed upon them. The University recognises the importance of avoiding and managing stress and anyone who feels that work-related stress is adversely affecting their ability to function effectively should seek advice from the Head of School. Stress management guidance is provided in section 3 of the University Staff Handbook, available on-line (http://www.nottingham.ac.uk/staff-handbook).

1.5.7 Good Housekeeping
Good Housekeeping is an essential part of good working practice and is conducive to safe working conditions. Equipment should always be returned to its storage area after use and the work area (including benches and tables) should be left cleared and clean. Electrical cables should not trail across the floor. Access to high level storage should be facilitated through using one of the step stools available in the School (rooms A1 & A27) and not by standing on chairs. Waste materials should be disposed of in accordance with appropriate procedures (see section 2.3.6 below) and only non-hazardous materials may be placed in waste bins throughout the School. In most School offices and work spaces there are two waste bins provided, one for paper waste (which will be recycled) and one for plastics and other non-paper items. Cardboard boxes may be disposed of in the dump bins labelled for that purpose at the rear of the building. The Sir Clive Granger Building Portering Staff can give advice on disposal of packing cases and cardboard boxes.

A hazard notice must accompany any item of equipment left running unattended. Instruction must be displayed in accordance with the University standard form.

When finishing work in laboratories or the workshop, dedicated hand washing sinks should be used to remove possible contaminants from hands and wrists before leaving the laboratory. These sinks are clearly labelled. Additional care should be taken before leaving the laboratory or workshop for the purpose of consuming food or drink. Disposable gloves should be washed, removed and discarded into the designated waste container. They should never be worn outside of the laboratory or workshop in which they are being used and, where practicable, they should not be used to handle general laboratory items which are not an integral part of the experiment, such as door handles, chairs etc as this can lead to a potential spread of contamination. No hazardous items should be transported between laboratories, unless written permission has been given by the School Safety Officer after receipt of an appropriate risk assessment.

Laboratory coats and workshop overalls may become contaminated with toxic materials and should be removed before leaving the work area. Within the School of Geography, they should not be worn outside the laboratories and workshop. The laboratory coats owned the School and borrowed by individuals for general laboratory use are located in the CAM King and HH Swinnerton Laboratories. These are laundered on a termly basis under the management of Mr Graham Morris, unless a particular contaminant residue (eg as a result of a spillage) is identified to him, whereupon he will arrange for them be sent for immediate laundering. Individuals using their own laboratory coats should ensure that they are kept in a clean and uncontaminated state by regular washing.

1.5.8 Visitors

All unaccompanied visitors to the School are required to report to the School Office. They will then be transferred to the care of another member of staff who will ensure that they are familiar with the relevant parts of this statement. Visitors must not enter the workshop or the laboratories unless accompanied by a competent member of staff familiar with the hazards of these work environments. Where possible, permission to bring a visitor into the laboratory or workshop environment should be sought, in advance, from Mr Graham Morris (School Laboratories) or Mr Ian Conway (Workshop).

1.5.9 Children and Young Persons

Members of the School are discouraged from bringing their children into University premises other than public areas of the public buildings (e.g. Portland Building and Libraries) except for social purposes such as organised functions which are restricted to low hazard areas (see *Safety Office Circular P7/95A*). If you wish to bring children into University premises at other times (e.g. due to child-care difficulties) this is at the sole discretion of the Head of School, to whom an application should be made for written authority. A risk assessment should be carried out in conjunction with the School Safety Officer prior to seeking authorisation from the Head of School. Permission may not be granted. Children must be placed under close supervision at all times and are forbidden from entering the laboratories or workshop areas.
This policy does not apply to organised visits such as open days to which normal safety arrangements would apply.

1.5.10 Adults Assisting in University Work

University Policy to ensure the safety of adults informally assisting members of the University in their work is described in *Safety Office Circular P/795B*. This practice is discouraged but should the need for this arise then permission is at the sole discretion of the Head of School, to whom an application should be made for written

authority. A risk assessment should be carried out in conjunction with the School Safety Officer prior to seeking authorisation from the Head of School. Permission may not be granted.

1.5.11 New and Expectant Mothers
Where the nature of the work area or work activities may present a risk to a new or expectant mother, it is the responsibility of that person to notify the Head of School or the School Safety Officer at the earliest opportunity in order to enable the work to be specifically assessed. Risks to new and expectant mothers may be physical (manual handling, ionising radiation), chemical (carcinogenic substances) or biological (micro-organism, blood) in nature. A risk assessment of the work activities and environment must be carried out in conjunction with the School Safety Officer. Where significant risks are identified, the Head of School will be notified and appropriate actions will be taken. Similar arrangements apply to those who return to work and are breastfeeding where aspects of the work or environment could adversely affect them or the infant. Further details are described in *Safety Office Circular P2/99A*.

1.5.12 New Projects, Equipment, Materials or Processes
The initiator of any new project or activity, usually a member of staff, is responsible for the assessment of all possible safety hazards that may arise (see *Safety Office Circular 7/88E*). A copy of the risk assessment and written protocols (including COSHH) should be lodged with the School Safety Officer.

When ordering new materials, a substance safety order form must be completed prior to placing the order with the School Financial Accounts Officer, Mr John Love. Forms are available in the CAM King Laboratory, from the School Safety Officer and from the School Financial Accounts Officer. The substance safety order form requires individuals to assess the potential risks of ordering any chemicals, new equipment, substances etc that they may require and to ensure that the School has sufficient mitigation measures in place to minimise risk to acceptable levels prior to placing the order. A copy of this form should be submitted to the Head of School along with the order for approval. Completed safety order forms should be returned to the School Safety Officer or, in the case of laboratory items, to Mr Graham Morris.

Chemicals that have been ordered from commercial suppliers must be delivered directly to the laboratories (HH Swinnerton Lab, A30 or CAM King, B28) where they will be received by Mr Graham Morris or Ms Teresa Needham. Chemical supply deliveries must not be accepted in the School Office (A1).

1.5.13 Equipment taken out of use
When equipment is taken out of use it must be stored in a clearly labelled location and its electrical competence tested. Where the item is no longer required it must be disposed of through the appropriate waste route. Prior to disposal the inventory number of the equipment must be checked off with Mr John Love. This is essential and no School equipment should be disposed of without his approval.

1.5.14 Manual Handling
Tasks involving the lifting, moving and supporting of loads by physical effort are subject to the Manual Handling Operations Regulations 1992 (See *Safety Office Circular 9/93B*). Members of the School who are regularly involved in such operations shall receive training in lifting and handling through attendance at the University-run Handling & Lifting Course. For persons who are occasionally involved

in manual handling tasks (e.g. moving and filing records by members of the School Office), Ian Conway will provide an in-house training session on risk management associated with manual handling operations. Where practicable, mechanical aids will be provided to minimise any risk of injury: School members moving cardboard boxes of materials, computers, rocks etc should use one of the three School trolleys provided for this purpose; these are located in the reprographics room (A29) and the fieldstore (A30b) and accessible during normal working hours. You are also encouraged to use the lift (located in the foyer opposite the porters office) for transferring materials between floors rather than carry heavy items up and down the staircases. Anyone wanting further information or guidance should see Ian Conway.

1.5.15 Monitoring

Review and monitoring of performance, procedures and work equipment is an essential part of health and safety management. The School has a programme of active monitoring and review which includes regular inspection of potentially hazardous work environments (laboratories & workshop) and checking interlocks and safeguards on routine work equipment. Reports of these inspections are made to the termly meeting of School Safety Committee. The authorised persons responsible for each work area (identified in section 1.4) instigate the inspections according to either a routine audit timetable or a specific incident associated with the work environment, procedure or equipment.

1.5.11.1 Arrangements and timetables for inspections

Current monitoring arrangements within the School are as follows:

(a) A School Audit Inspection is undertaken by the School Safety Officers (Prof Michèle Clarke & Mr Ian Conway) annually. All areas of the School are inspected.

(b) A30/HH Swinnerton Laboratory & B28/CAM King Laboratory (Mr Graham Morris): the work area is audited on a monthly basis. The fume cupboard (standard work) is examined and tested every 14 months by the Estates Office. Interlocks and safeguards on the centrifuge and laser particle analyser are tested monthly. Protective clothing and glasses owned by the School and supplied to laboratory users are checked for scratches, tears and overall effectiveness on a monthly basis. Compressed gas cylinder regulators & lines are checked for leaks on a weekly basis. Water systems which may pose a legionella risk, including storage tanks for the laser particle size analyser and the sand box flume are, where practicable, emptied after each experiment. Mr Graham Morris undertakes a weekly audit of possible sources of legionella bacteria in all three of the School's laboratories.

(c) A32/Environmental Change Research Laboratory (Prof Michèle Clarke, Mr Graham Morris): the work area is audited on a monthly basis. The fume cupboard (standard work) is examined and tested every 14 months by the Estates Office. Interlocks and safeguards on the centrifuge, grinder, laser particle analyser and Risø TL-OSL Reader are tested monthly. The sealed radioactive sources (beta and gamma emitters) located in the luminescence research laboratory are audited on daily basis and the fail-safe shutter on the sealed ^{90}Sr-^{90}Y ionising radiation source is tested on a weekly basis. Radiation Users must comply with University regulations and the local rules which apply to the Environmental Change Laboratory. All work with ionising radiation must be approved, in advance, by the Radiation Protection Supervisor, Prof Michèle Clarke. The Wessington Cryogenics liquid nitrogen vessel performance is checked and approved by the gas supplier (BOC) every year. Only University trained personnel may handle cryogenic vessels or liquids.

(d) A30a/Workshop (Mr Ian Conway): the work area is audited every semester. The interlocks and safeguards on the Startrite 18-s-10 band saw are examined on a monthy basis. Use of the acetylene welding apparatus is governed by the provision of a hotwork permit and the gas cylinder, regulator & lines are checked monthly.

(e) A29/A35/Reprographics (Ms Elaine Watts): the work area is audited every term. The interlocks and safeguards on the guillotine, laminator, binder and cutting devices are tested monthly.

(f) B26e/Graduate Computing Laboratory (Mr Chris Bates): the work area is audited every term

(g) B29/David Ebdon Computing Laboratory (Mr Chris Bates): the work area is audited every term

(h) School Vehicle (Mr Ian Conway): all users must have obtained a University car or small van permit through the Commercial Services on-line permit application process before using the vehicle. Drivers of the School vehicle must complete a check-list to ensure road worthiness of the vehicle, each time the car is used.

(i) Electrical Appliances (Mr Ian Conway, Mr Graham Morris, Ms Teresa Needham): PAT-trained assessors are responsible for updating the equipment inventory and repeat testing fixed installation equipment every 24 months, and portable equipment as appropriate (<4yrs).

(j) DSE (Ms Elaine Watts): new assessments are undertaken by one of the trained DSE-assessors either on request or prompted by change in work station or work environment.

1.6 University Safety Office, Policy and Guidance Notes

The University Safety Office is responsible for advising Schools on all aspects of health and safety at the University. The Safety Office communicates with the School of Geography through the School Safety Officers and seeks to provide support and advice, normally through the contact with the School Safety Officer, who reports to the School through a termly report to staff meetings and via the School of Geography web page.

The Safety Office provides a range of policy and guidance notes on its web page. The specific circulars mentioned in this School policy statement are also available on-line from:

http://www.nottingham.ac.uk/safety

Anyone with a health and safety query of any kind should raise it with the School Safety Officer in the first instance. She will then seek guidance and advice from the University Safety Office if appropriate or necessary.

PART 2. PARTICULAR AREAS AND ACTIVITIES

2.1 Use of the Building outside normal working hours

The safety of anyone can be affected by fire, accidents and unauthorised intruders. Individually working after 6 pm during weekdays or at any time over the weekend must sign the Late Working Register, which is found opposite the Porters Office. The David Ebdon Laboratory, B29, may be used outside of normal office hours using a University Card to gain access via the rear external staircase. Occupants must vacate the room on hearing the fire alarm.

2.2 Lecture Rooms and Offices

Pathways, corridors and stairways must be kept clear of obstructions for access and evacuation.

2.2.1 Display Screen Equipment

Display Screen Users (University employees who habitually use DSE as a significant part of their normal work) within the School are identified and assessments of their workstations are carried out. Records of this information are maintained and any queries regarding DSE safety should be directed to the School Assessor, Ms Elaine Watts. Eye tests are available for Users on the recommendation of the DSE assessor.

2.2.2 Laser Pointers

Anyone owning laser pointers for use in lecture rooms etc should register them with the School Laser Supervisor, Prof Michèle Clarke. Persons wishing to purchase laser pointers should contact the Procurement Office (ext 15661) for advice.

2.3 Laboratories and Workshops

The following specific advice relates to general procedures and practice in the Laboratories and Workshop in the School of Geography.

Great care should be taken when using any machinery to avoid both personal injury and damage to equipment. School codes of workshop practice, establishing who may use any particular equipment, the times of such use and the conditions governing such use, must be strictly observed. Only trained and authorised persons should be allowed to use hazardous equipment and adequate arrangements should be made to prevent their use by unauthorised persons.

The Provision and Use of Work Equipment Regulations 1998 apply to work equipment, the definition of work equipment being any machinery appliance, apparatus or tool, or any assembly of components which in order to achieve a common end are arranged and controlled so that they function as a whole. This definition is very wide and examples would include power press, guillotine, air compressor, lifting sling, acid safety cabinet, portable drill and overhead projector.

The regulations cover two aspects of safety in relation to work equipment:

- *Management* issues - selection and suitability, maintenance, information, instruction and training and compliance with Product Safety Regulations.
- *Physical* characteristics - machinery guarding, other specified hazards, extremes of temperature, controls, isolation, stability, lighting, markings and warnings.

Mr. Ian Conway is responsible for the workshop A30c and his instructions when working there must be followed at all times. In particular, as a point of law, no

unqualified person may operate any woodworking machinery. Work involving welding, brazing or cutting must be performed in accordance with the Hot Work Procedures and a risk assessment for that hot work completed.

2.3.1 Safe working practices: general rules

Loose clothing must not be worn near moving machinery. Particular attention should be paid to ties and other forms of neckwear. Suitable footwear must be worn in workshops and laboratories. Long hair must be protected from contact with machinery by wearing suitable headgear. Goggles must be worn when using grinding wheels or any other process where there are flying particles (*see Safety Office Circulars 11/86A, 12/86C and 3/88F*). The use of dust masks is recommended where there is prolonged exposure to dust or particles. Rings should not be worn when using machinery.

All chemicals should be regarded as toxic by ingestion. **Hence, pipetting liquids or solutions by mouth is strictly prohibited**; use a pipette pump, syringe or a mechanical dispenser. Never deliberately taste, swallow or inhale any chemical.

Chemicals can also enter the body through the skin absorption or through the accidental inhalation of vapours or dusts. Suitable protective equipment must be worn when handling chemicals. Cuts and wounds are particularly vulnerable and may allow direct entry of chemical substances into the bloodstream. Broken skin should be covered with a suitable dressing, but if the wound is on the hand then the dressing should be waterproof and rubber gloves must be worn while handling chemicals. Always wash your hands before touching other parts of your body (especially the area around the eyes) or before taking food. Hand washing may be undertaken in the designated sinks for this purpose, which are clearly labelled in all laboratories and in the workshop.

Do not smoke, eat or drink in the presence of chemicals.

2.3.2. Centrifuges

All centrifuges are required to have covers with interlocking safety switches. **Never** over-ride these switches to open the centrifuge when it is operational.

The following procedures must be adopted when using centrifuges for whatever purpose:

a) Before use, read the manufacturers instruction manuals and safety precautions; always operate the centrifuge in accordance with these instructions. Ask for guidance from the Area Safety Manager if you are any doubt about operational procedure.

b) Balance the tubes carefully and position correctly on the rotor

c) Never exceed the maximum speeds for the centrifuge, rotor, type of tubes or solutions being used

d) Always ensure that the rotors and buckets are clean and dry before and after use

e) Never use hazardous substances in the centrifuge without having undertaken a risk assessment and acquiring written permission from the Safety Officer.

2.3.3 COSHH

The School uses a variety of substances which are hazardous to health. New regulations updating the Control of Substances Hazardous to Health (COSHH) regulations (1988) came into effect in January 1995. As a result of these regulations, any hazardous substances which are to be used, or which may result either as an intermediate substance or a final product or as a waste product, must be assessed

for the hazards and risks involved BEFORE the activity is begun. COSHH Assessment Forms are kept in the School Office, CAM Ling and HH Swinnerton Laboratories, the Workshop and by the School Safety Officers. In addition, the Safety Officers can provide guidance on completing the forms. Copies of the COSHH must be lodged with the SSO and also available for inspection in the location of work in which the COSHH assessment is relevant (*i.e*. HH Swinnerton Laboratory, CAM King Laboratory or Workshop).

For first and second year undergraduate laboratory work, no COSHH is required by students in the handling of chemicals. The COSHH assessment is implicit in the experimental instructions provided (*i.e*. the academic supervisor is responsible for undertaking the COSHH assessment for the procedure). Students are required to keep to the guidelines laid down in individual experiments (*e.g.* working in a fume hood or wearing protective gloves when specified) and not to deviate with these instructions unless the matter has been discussed with the laboratory technician or academic member of staff on duty. Unauthorised experiments are strictly forbidden.

COSHH assessments are required for third/fourth year project work if chemicals are to be handled. The assessment must be completed BEFORE the experiment is attempted. The nature and scope of the assessment will vary with each project. Where there is a routine protocol to be followed, a single 'blanket' assessment may be all that is required.

2.3.4 Chemical and flammable substances

Chemicals and flammable liquids will be stored only in the designated storage areas appropriate to the substance (*i.e*. shelf, fire resistant cupboard, refrigerator etc). Chemicals should be returned immediately after use to their proper storage locations. No School laboratory or work place may store more than 50 litres of highly flammable solvent. Small quantities (*i.e*. less than 50L) of flammable substance may be only stored in fire-proof steel cupboards of the correct rating. Waste solvents must be disposed of correctly into clearly labelled solvent containers. Care must be taken to ensure that flammable solvents are not dispensed near naked flames, hot surfaces or other sources of ignition (*e.g*. a light switch). Flammable solvents MUST NOT be heated in open flasks.

All spillages must be cleared up immediately

Certain chemicals are restricted access and may be used only on the written authority of a member of the academic staff, in consultation with the Safety Officer. Mr Graham Morris is responsible for the management of all chemicals within the School.

Hydrofluoric Acid may NOT be used or stored in the School of Geography.

2.3.5 Cryogenics

This refers to all substances kept at temperatures below -70°C. In the School of Geography, cryogenic liquid nitrogen is routinely used in the Environmental Change Research Laboratory. Only approved and trained workers may handle cryogenic materials or vessels used for storage of cryogenic liquids. To avoid injury it is essential that the following procedures are adopted:

a) Always wear appropriate footwear, cryogenic gloves and eye protection when dispensing liquid nitrogen

b) Never pick up anything that has been cooled with liquid nitrogen without wearing cryogenic gloves
c) Never touch any part of a cryogenic vessel containing super-cooled liquid without wearing cryogenic gloves
d) Never dispense liquid nitrogen in an enclosed space without appropriate ventilation. Always ensure that doors are open to allow free circulation of air.

Prolonged exposure of liquid nitrogen to the atmosphere can create an explosion hazard through the condensation of liquid oxygen in a vessel containing the nitrogen. Never pour liquid nitrogen into any container other than the dewars which have been approved for cryogenic use.

In the event of a cryogenic burn, apply copious amounts of tepid water to the affected area of skin to minimise tissue damage and apply a loose, non-fluffy sterile dressing. Do not apply heat to the affected area. Loosen any clothing that may restrict blood circulation and move the injured person to a warm but not hot environment. Seek medical attention.

2.3.6 Disposal of Wastes

Differing rules apply to different categories of waste. COSHH assessments should be referred to for the disposal of hazardous substances. In the School of Geography the following rules apply:

(a) Water-miscible, ordinary laboratory solutions (*e.g*. salt solutions, indicator solutions, pH tests) can be diluted by addition to cold sink water and flushed away. Care must be taken to avoid spillages. This route is not suitable for highly potent toxins (see COSHH). Cold water must be used to prevent vaporisation of liquid and only low vapour pressure liquids can be disposed of in this way.

(b) Immiscible solvents and solvents with high vapour pressure (ethers, alcohols and ketones etc) should be disposed into waste solvent cans. The identity of the solvents and the room of origin should be clearly marked. Waste solvent cans can corrode and leak and are a potential fire and intoxication hazard. They must be stored in a ventilated area and must be replaced every 2 months.

(c) Paper, card, fabric and other dry, uncontaminated waste may be placed directly into an unlined wastepaper or recycling bin. Cardboard boxes can be disposed of in the recycling metal dumpster bin located at the rear of the Sir Clive Granger Building (at the top of the car park ramp). This disposal route is not suitable for sharps, wet or moist waste or biohazard material.

(d) Broken glass, disposable glass pipettes, blades, needles and other sharp items should be placed in a large cardboard Sharps Disposal Box, which will be collected by the portering staff on a monthly basis. Liquids should not be placed into this Disposal Box and therefore all used pipettes must be drained. Nothing must protrude from the box and it should not be filled more than 2/3 full; in this case a new Disposal Box should be used.

(e) Solid plastic, metal, cans, aerosols, batteries and other incombustible waste should be placed within large solid organic or yellow bins marked "Incombustible Waste" for daily collection by portering staff. Batteries should be bagged and taped to prevent circuit formation.

(f) Biological materials such as blood, faeces etc should be disposed of in yellow plastic disposal bags. These should be marked with the room of origin and the date and sealed with tape. These should be delivered to Stores in the Medical School for incineration within at least a week and preferably daily.

(g) Material contaminated by radiation (*e.g*. old smoke alarms) should be stored and disposal routes discussed with the Radiation Protection Supervisor, Prof Michèle Clarke.

2.3.7 Electrical Equipment

The School complies with the University Code of Practice for Electrical Safety. All items of portable electrical equipment shall be inspected/tested in accordance with the guidance in the above document. Inspection and testing is carried out by Mr Ian Conway, with the exception of the laboratories where testing is carried out by Mr Graham Morris and Ms Teresa Needham. An inventory of equipment is maintained by Mr John Love and is kept in his office A36, with the exception of the laboratories where it is kept in B28 by Mr Graham Morris. Any new items of electrical equipment including those which are brought from home must be added to the inventory and inspected/tested. Members of the School must report any problems arising with electrical equipment to Mr Ian Conway.

2.3.8 Eye Protection

When working in the laboratories or the workshop it must be assumed that all chemicals will cause damage if allowed to contact the sensitive surface of the eye. Some chemicals have a severe damaging effect, especially acids, alkalis and those chemicals, which are classified as corrosive or as irritants. Many solvents fall into this category. **Hence, the wearing of safety spectacles or other appropriate and approved eye protection in laboratories is essential when handling chemical compounds** (see *Safety Office Circulars 11/86A, 12/86C and 3/88F.*) Eye protection is also essential when working on equipment in the workshop and with UV light sources (see section 2.3.24).

2.3.9 Fume Cupboards

Fume cupboards are located within the CAM King Laboratory, HH Swinnerton Laboratory and Environmental Change Research Laboratory. Fume cupboards provide one of the most important controls over exposure to hazardous substances. They can also provide protection against physical hazards. There should be clear indication of the purpose for which a fume cupboard may or may not be used. Users of fume cupboards must always match the work being undertaken to the suitability of the cupboard concerned. There must be a system for regularly monitoring the effective operation of fume cupboards.

There is a University Standard for the performance and maintenance of fume cupboards (P11/01A).

- Radioactive work must be carried out in fume cupboards with a face velocity of 0.7 m/s;
- Standard hazard work must be carried out in fume cupboards with a face velocity of 0.5 m/s,
- Storage only is permitted in fume cupboards with a face velocity of beneath 0.5 m/s but must exceed 0.2 m/s.

The Engineers section of the Estate Office maintains a register of all fume cupboards and arranges for them to be examined and tested every 12-14 months. Copies of the results from this are held both Mr Graham Morris and the Estate Office.

A considerable number and variety of chemical compounds should only ever be used inside an efficient fume cupboard *e.g.* aromatic hydrocarbons (benzene, toluene, phenol etc) and carbon tetrachloride. You must always be aware of the hazardous properties of the compounds you are using so that risk of exposure can be estimated. Manufacturers safety data sheets and COSHH assessments for the procedure should be consulted in advance. If the hazards are unknown, then a fume cupboard should be used.

2.3.10 Furnace

The School of Geography has two muffle furnaces, located in the CAM King Physical Laboratory, capable of reaching temperatures of >800°C. Use these furnaces should be agreed with the Laboratory Manager, Mr Graham Morris. Items should only be placed into, or removed from, the furnace once the temperature has dropped below 40°C and only long sleeved furnace gloves may be used for this purpose. All hot items removed from the furnace must be placed on the metal tray. Never place hot items directly onto the bench!

2.3.11 Gas Cylinders and Valves

Gas cylinders are located in the workshop (A30c), the CAM King Physical Laboratory (B28) and in the gas cage located outside the building on the ground floor near the car park. Cylinders are painted and colour coded in accordance with B.S.349 with warning bands identifying toxic (yellow band) or flammable (red band) hazards.

Cylinders should always be stored vertically, in a well-ventilated area away from the risk of fire or heat. They must be secured against a bench or wall or placed in a suitable stand. Cylinders should never be left free-standing. In order to transport a gas cylinder, the gas valve should always be closed and the pressure regulating valve removed. A purpose built cylinder trolley must be used for transporting cylinders. The cylinder trolley in stored the gas cage and access can be arranged via Mr Ian Conway, Prof Michèle Clarke or Mr Graham Morris.

The following gas lines from the outside cage feed into the building:

CAM King Physical Laboratory (B28):	Acetylene
	Nitrous oxide
	Argon
	Helium
Environmental Change Laboratory (A32):	Oxygen-free nitrogen x 2

Leak tests may only be carried out using appropriate fluids.

2.3.12 Glassware

Glassware must always be handled carefully. Glass tubing can easily be broken and can cause severe damage to hands. Protect you hands and use appropriate lubricant when fitting flexible plastic or rubber tubing over glass tubing, or fitting a glass pipette into a safety filler or dispenser. Particular care should be taken when breaking ampoules open. Where the contents are hazardous, *e.g*. toxic, carcinogenic, infectious, a proprietary ampoule breaker should be used.

Any crack considerably reduces the strength of glassware, and the item should either be sent for repair before further use, or discarded. Chipped glassware should also be discarded. The appropriate waste disposal methods must be used, as given in above (see *Safety Office Circular 11/87F*.)

2.3.13 Hotwork

Hot Work is defined as work involving the application or generation of heat such as cutting, welding, brazing, soldering and the use of blow-lamps (*Safety Office Circular P7/00A*). Hot work involving the application of heat, either directly to, or adjacent to plant, tanks, vessels and pipes that have contained or do contain explosive, flammable or toxic substances can create the following hazards:

- Explosion as a result of flammable vapours under pressure being ignited within a confined space.
- Fire from sparks and heat generated in areas containing combustible and flammable materials
- Eye injury including ultra-violet damage, burns, heat exhaustion
- Asphyxiation by gases or vapours or poisoning by toxic fumes

For routine hotwork, such as that carried out in the workshop under the direct supervision of Ian Conway, a standard operating procedure must be drawn up which can be followed each time the hotwork is carried out. For non-routine hotwork, a risk assessment must be carried out in conjunction with Ian Conway and a Permit to Work issued for each job taking into account the specific hazards involved. Hotwork regulations apply to such work carried out by contractors as well as University staff. Contractors are managed by the Estates Office.

2.3.14 Induction in Laboratory Work

All members of the School must undertake laboratory induction training before working in the School laboratories. Induction sessions are run by Mr Graham Morris and provide familiarisation training with School policies and procedures regarding laboratory work. A formal record is kept by Mr Morris of attendance at these training sessions. In the absence of Mr Morris, training will be given by the Laboratory Technician, Ms Teresa Needham or the School Safety Officers.

2.3.15 Ionising Radiation

All work with radioactive sources, X-rays and electron microscopes is governed by strict codes of conduct. All employees and students undertaking projects which involve such work must be registered with the University and must attend the necessary training courses. Radiation detector badges must always be worn where these are deemed appropriate. The School Radiation Protection Supervisor (RPS) is Prof Michèle Clarke and all work with ionising radiation must be formally approved in advance by the RPS.

The University booklet "Radiation Safety Rules for Work with Radioactive Substances" should be read and complied with. The following sealed radioactive sources owned by the School are housed in the Environmental Change Research Laboratory

Only authorised personnel may handle these radiation sources. Access to the luminescence research laboratory (A32 suite) where the Trefoil Radiation symbol is posted on the door is strictly limited to authorised personnel. Contractors or Estate Office staff who require access to the services in this area must be supervised by authorised personnel. Each maintenance worker must be shown the risk assessment

relating to maintenance work in the laboratory and sign the log book to confirm this. If practicable the authorised personnel should remain in the room during the course of the maintenance procedures.

Isotope	Activity		Type	ID/ reference number	University Reference
$^{90}Sr/^{90}Y$	40mCi	1.48GBq	Plaque source	SICB10698	U 88
$^{90}Sr/^{90}Y$	40mCi	1.48GBq	Plaque source	-	U92
^{55}Fe	10µCi	370KBq	5ml sealed solution	285D20	U89
^{57}Co	1.08µCi	38.9KBq	Plastic disk	D-63-1	U90
^{60}Co	1.0µCi	37KBq	Plastic disk	283D25	U91
^{137}Cs	1.03µCi	38.1KBq	Plastic disk	D-78-8	U94
^{14}C	10µCi	370KBq	Mylar disk	77E04	U95
^{210}Pb	0.01µC	0.37kBq	5ml sealed solution	79E24	U93
^{238}U	1.0µCi	37kBq	5g uranyl nitrate	81E08	UR2
Multigamma Standard *	1.33µCi	49.2kBq	100g soil matrix	1053	UR1

* ^{155}Eu (0.109µCi), ^{57}Co (0.185µCi), ^{113}Sn (0.330µCi), ^{137}Cs (0.064µCi), ^{54}Mn(0.142µCi), ^{65}Zn (0.486µCi), ^{40}K (0.019µCi)

Anyone considering working on the Scanning Electron Microscope or the Electron Microprobe, both held in Archaeology, should attend the appropriate University training course and carry out a full risk assessment before starting the work.

For Further Advice Contact: The School Radiation Protection Supervisor or the Safety Office - tel. 13401.

2.3.16 Work at Height

Work at any height from which someone could fall and be injured is subject to The Work at Height Regulations 2005. The Regulations apply to all work at height where there is a risk of a fall liable to cause personal injury. No minimum height is specified thus application is dependant upon assessment of the risks under the circumstances of the operation and the reasonable practicability of control measures. Activities include working at height off ladders, step ladders, step stools or in locations from which people could fall, such as roofs, parapets or similar natural locations. An inventory of all access equipment is maintained by Ian Conway. Inspections are carried out annually and recorded on this inventory against each item of access equipments unique ID number. Generic risk assessments for using access equipment are held by Mr Ian Conway.

2.3.17 Lasers

Most types of laser operating in the visible and near infra-red regions are sufficiently intense as to represent a hazard to the eye. The exceptions are some very small lower power semi-conductor lasers, which emit only a few microWatts of optical power. Laser hazard is identified by classification of the laser (1 to 4, with 3 and 4 posing greater hazard), according to peak power and wavelength of light emitted.

Class 1: <0.5mW
Class 2: <2mW (visible)
Class 3A: <5mW
Class 3B: >0.5mW invisible or 5-300mW visible
Class 4: >10mW

Safety measures usually concentrate on making the beam path inaccessible. In the case of established applications (i.e. particle sizing, interferometry and Raman spectrometry) the laser will be enclosed. Where research applications with un-enclosed high power beams are involved, a mixture of engineering controls, administrative procedures and personal protection will be needed. It is important to establish whether the laser used produces a beam in the visible part of the EM spectrum or not. In the case of the latter, personnel may be unaware that they have been exposed to laser radiation unless clear warning is given that the laser is operating.

Although damage may be caused to the skin and all parts of the eyes, the most vulnerable part is the retina, on which the beam may be focused by the eye lens resulting in the destruction of tissues and the creation of permanent blind spots. Lasers should be operated with as high a background level of illumination as possible to ensure that the pupil of the eye is small and in some cases it may be advisable to wear protective goggles. The goggles to be worn should be appropriate to the wavelength of the laser beam being used. Care should be taken to check the paths of all possible reflections and if necessary non-flammable opaque screens should be used to protect personnel.

A video entitled "Laser Safety in Higher Education" is available from the Safety Office.

All employees must register laser pointers or any equipment containing lasers with the School Laser Supervisor, Prof Michèle Clarke. All lasers of Class 2 or above should be labelled with an appropriate hazard notice and must be registered with the Safety Office.

The School of Geography currently holds Class 2 lasers as follows:
Laserex LDP-400 Laser Pointer (A30b)
Leica TCR 307 Total Station (A30b)
IR thermometer (B28)

The following precautions are necessary when using Class 2 lasers: *Precautions should be taken to ensure that persons are not exposed to the direct beam or a reflection*.

At present the School holds Class 4B lasers housed within the two Coulter LS 230 Laser Particle Size Analysers (one in the CAM King Laboratory B28 & the other in the Environmental Change Laboratory, A32). In normal operation when the laser beam is operating within the equipment housing, these lasers are defined as Class 1. However, where the beam is not protected by the equipment housing (e.g. during maintenance operations which could bring a worker in more direct contact with the beam) these infra-red lasers operate under Class 4B. Only trained and registered laser users (Prof Michèle Clarke and Mr Graham Morris) are permitted to operate maintenance tasks on this equipment and clear warning notices to this effect are posted on the equipment.

Anyone considering purchasing equipment containing a laser should consult the School Safety Officer well in advance.

2.3.18 Microwave Ovens

The School of Geography has one microwave oven and a microwave digester, both located in the CAM King Laboratory. Microwave ovens are designed to ensure that all microwave radiation is contained within the working volume. However, if damage occurs there is a possible risk to operating personnel. It is therefore necessary to arrange for periodic measurements of the radiation levels outside the oven. The Engineering Faculty Workshop have the facilities to carry out these tests and are prepared to do so on request. (*see Safety Office Circular 5/89C*). Further information on the occupational exposure levels associated with the use of sources of optical and electric and magnetic fields is contained in NRPB report R265, 1994, which is held by the Safety Office.

2.3.19 Paint Spraying

Paint spraying must only be carried out in a suitably ventilated area. Particular care must be taken when using isocyanate containing ("2-pack") paints since this material is a potent respiratory sensitiser. If you wish to spray paint anything please seek advice from the Head Technician, Ian Conway (room A30a).

2.3.20 Personal Protective Equipment

Laboratory coats and safety spectacles must be worn in the School Teaching Laboratory at all times. Laboratory coats and safety spectacles should be used in the research laboratories where appropriate. The occupants of the laboratory should ensure that any visitors or tradesmen are similarly attired where necessary. Additional items of personal protective equipment (e.g. face-shields, dust masks, gloves, plastic aprons, etc.) are also provided for specific tasks; the protection worn must be appropriate to the work being undertaken.

Bare skin presents areas for contamination by chemicals, micro-organisms and radioactive substances etc. The laboratory coat provides protection for the arms and body. Laboratory coats may become contaminated with toxic materials and should normally be left behind when leaving the work area. They must not be worn in any area set aside for tea and coffee making or for the consumption of food or beverages. They should be washed regularly and whenever they become contaminated with chemicals.

It is necessary to protect the feet and legs from chemical spillage or from damage from heavy equipment being dropped. Suitable footwear must be worn. The wearing of open-toed shoes or sandals in laboratories is not permitted, as their use makes the feet extremely vulnerable to injury from broken glass, spilt corrosive substances, liquid nitrogen, etc. Loose fitting sandals, especially those with no heel restraint, are not secure and may present a tripping hazard.

Loose long hair can be a danger to personal safety in the laboratory. It is readily ignited (lacquer increases this risk) or it could become trapped in equipment or machinery. Long hair should always be tied back.

Chemical protective gloves are available in a range of materials including natural rubber, neoprene, nitrile, butyl, PVA, PVC and viton. The degree of protection against chemical permeation depends on the glove material, its thickness and the way it is made. Different materials offer widely ranging resistance to permeation as defined by the "breakthrough time". Glove suppliers provide information to assist in glove selection. It should be remembered that the liquid may be the solvent for other more hazardous chemicals being used and as such will enable these to diffuse through the

glove with the solvent, which may also carry the chemical to into the skin. Solvents may also adversely affect the physical characteristics of the glove and impair its protective properties, for example by leaching plasticising agents out of the glove causing it to become more brittle, cracking and thus leak.

It is important to check gloves for damage such as holes, cuts and distortion.
Reusable ones should be examined for signs of internal contamination. Gloves worn to protect against hazardous substances **must** be removed and placed for disposal before leaving the laboratory in which such work is being undertaken. The wearing of potentially contaminated gloves in the corridor, rendering others at risk, is strictly forbidden.

The normal requirements on removal of protective clothing prior to entering offices, seminar rooms, rest areas and when entering public areas apply. Food and drink along with preparation equipment and eating utensils must be stored and handled separately from chemicals and biologically toxic materials. Separate refrigerators must be provided for the storage of food and drink and laboratory refrigerators should not be used.

2.3.21 Respiratory Sensitisers (Dust, Latex)

Certain laboratory procedures including those which generate dusts (*e.g*. sieving or work with fine soil) may cause an allergic response in some individuals, including asthmatics. Individuals who know they are allergic to certain respiratory sensitisers should discuss this in advance with the Laboratory Manager and the Safety Officer. Where appropriate, personal protective clothing such as dust masks may be worn.

Natural rubber latex is known to cause an allergic response in some individuals working in environments in which products composed from this material are extensively used. Latex allergy in the laboratory or clinical environments is particularly associated with the use of powdered latex gloves. The powder helps to disperse the latex protein, greatly increasing exposure when compared with non-powdered gloves. The allergy may be respiratory or contact dermatitis. The type of glove used can play an important part and powder-free or non-latex types are available and should be used particularly where the nature of the work involves frequent removal and replacement of gloves. Powdered latex gloves are not permitted in the School of Geography and alternatives should be sought.

The University's policy provides information on the causes and symptoms of allergy to natural rubber latex, the ways of controlling the risk and the University's arrangements for dealing with those reporting symptoms (see *Safety Office Circular P01/00A*).

2.3.22 Surveying

Users of total stations utilising infrared laser beams should not look directly into the instrument. This applies particularly to reflector pole holders. The instrument must never be pointed directly at the sun because the telescope acts as a magnifying lens and can injure eyes. Never survey during thunderstorms as you will be at risk from lightening strikes. Due to the risk of electrocution it is very dangerous to use reflector poles in the vicinity of electrical installations such as power cables. Ian Conway will provide training in the safe use of total stations. Risk assessments should be undertaken before borrowing the equipment for fieldwork use.

2.3.23 Syringes

There is a risk of self-inoculation with pathogens contaminating sharps that have been used with biological materials. The following basic measures should be taken.

Sharps, i.e. syringe needles and scalpel blades etc, must not be passed directly from hand to hand and handling should be kept to a minimum. Needles should not be bent or broken before use. They must not be re-sheathed by hand, as this is a major cause of needlestick injury. Syringes/cartridges and needles should be disposed of intact. Sharps should always be disposed of at the point of use into a standard rigid yellow plastic containers supplied from the Medical School and some other University Stores (which complies with BS 7320:1990 and/or type approved under the Safety Handbook 2003/04 The University of Nottingham 62 *Carriage of Dangerous Goods (Classification, Packaging and Labelling) Regulations 1996*). The container must not be filled above the manufacturer's marked line and when full it must be locked shut for disposal. Sharps containers must not be placed inside clinical waste bags. Final disposal is via transfer to an incinerator in the Medical School. Graham Morris is responsible for organising waste disposal and he should be informed when containers become full. Sharps containers must not be left in public or general circulation areas whilst awaiting removal from the laboratories.

In the event of a used/dirty sharps-injury after a Used/Dirty Sharps injury, e.g. contaminated syringe needle, scalpel blade etc, or a human bite or scratch or splash of body fluid into the eyes or mouth the following steps should be taken; (unused/clean sharps do not present a risk). Encourage the wound to bleed and do not suck it! Wash the injury with soap and water, dry and apply a waterproof dressing. Use copious amounts of water to wash away a body fluid splash to the eyes or mouth. Notify the incident to your line manager, academic supervisor or other appropriate senior staff in the area. Complete an accident report form. The infection risk will need to be assessed. If the source is know to contain HIV, Hepatitis B or Hepatitis C immediate advice must be sought from Nottingham Occupational Health at Cripps Health Centre (ext. 14328), at QMC 0115 924 9924 ext. 44342; or at City Hospital 0115 969 1169 ext. 46657. Out of hours advice can be obtained from the Duty Microbiologist via QMC or City Hospital switchboards. Out of hours action can be obtained from the Specialist Registrar on call for A&E via the QMC switchboard. In cases other than the above advice should be sought as soon as possible from Occupational Health or out of hours from the duty microbiologist.

2.3.24 Ultraviolet Lamps

Users of ultra-violet (UV) emitting lamps must wear ultraviolet-radiation-blocking spectacles. This applies to sand tracer work and use of the Hönle SOL2 solar simulator in the Environmental Change Research Laboratory (A32).

Major sources of UV radiation include high and medium pressure mercury, metal halide and high intensity discharge lamps used in certain curing, drying and printing processes; xenon and carbon arcs and tungsten halogen lamps in lithographic and photocopying machines; low pressure mercury (quartz) lamps for germicidal control in sterile areas or microbiological cabinets; open-arc UV spectrophotometers and portable UV lamps for viewing chromatographs. Unfiltered tungsten halogen desk lamps also pose an UV hazard. Control of the hazards is by way of interlocked enclosures at the equipment or absorbance by glass windows or envelopes. Where protection has been built into the equipment care must be taken during non-routine operations such as maintenance so as to avoid exposures occurring through the protection being over-ridden or removed.

2.3.25 Woodworking machinery

Woodworking machines are particularly dangerous and difficult to guard and it is essential that only adequately trained persons should operate them. Ian Conway is responsible for all woodworking machinery in the School of Geography and any requests for woodworking activities should be addressed to him. Only authorised persons may use the Workshop woodworking equipment. The Woodworking Machines Regulations 1974 have been revoked and superseded by the Provision and Use of Work Equipment Regulations 1998. In addition there is HSE guidance and an approved code of practice specifically concerning the safety of woodworking machinery.

2.4 Reprographics

Only trained personnel must use the binding machine, power guillotine, power stapler and mounting press. These machines come under the direct responsibility of Ms Elaine Watts in the Cartographic Unit A35.

2.5 Fieldwork

Organisers of field courses/excursions must follow the guidelines in the School of Geography *Staff Guidance Regarding Health and Safety on Fieldwork.* A risk assessment document must be submitted to the School Safety Officer well in advance of any field course/excursion and a copy held in the School Office. At least one member of staff accompanying a field course should hold a current First Aid certificate.

Before attending any fieldcourses written safety instructions, including both general *notes (as given by the School of Geography, Instructions to Students on Fieldwork Handbook)* and any additional specific points relating to the work to be undertaken, must be read and signed by the students.

When students, undergraduate or postgraduate, are working on individual projects they must comply with lone working guidelines in the School of Geography *Staff Guidance Regarding Health and Safety on Fieldwork* and consider safety issues associated with the project/s and develop with their supervisor a hazard and risk assessment document. Permission to undertake the project will be refused if safe working procedures cannot be established. Development of safety awareness and the establishment of safe fieldwork procedures should be regarded as part of students general training in geography.

2.5.1 Work in High Risk Countries

The School follows University guidelines for evaluating the risks to personal safety and the inoculation requirements for University-related work or visits to high risk countries (see *University Safety Office Circular P4/97A*). Individuals are not expected to visit areas where there could be significant concerns for their health and safety. Where risks are identified (as part of the risk assessment process) these should be discussed with the School Safety Officer. The Head of School must be consulted for approval prior to any visit to a high risk country.

2.6 Student Placements

The primary responsibility for health and safety of a student on a placement lies with the employer but the School has a duty of care to check that the students are not sent to unsuitable environments. Prior to the placement, the member of staff supervising the student will write to the institution to verify that it has:

1. A written Health and Safety Policy

2. Registered insurance with the HSE or Local Health Authority
3. Performed a risk assessment
4. A mechanism of reporting accidents in accordance with RIDDOR.

All correspondence relating to health and safety should be copied to the School Safety Officer.

2.7 Driving vehicles on University business

All staff and postgraduate students who wish to drive either the School owned vehicle or a hire vehicle on University business must hold a valid driving licence and have obtained a University car or small van permit through the University Commercial Services on-line permit application process. Only holders of these Approved Drivers Permits will be allowed to drive the school or hired vehicles. Research supervisors are responsible for ensuring that postgraduate students have complied with University policy in accordance with *University Safety Office Circular P2/94C* (*1998 or later revisions*). Familiarisation training regarding use of the School vehicle is provided by Ian Conway. Staff using their own vehicle on University business must ensure that their insurance policy is extended to include business use.

2.7.1 Minibuses

Any drivers who passed their UK driving test after 1st January 1997 must also take and pass a DETR Category D1 2-part driving test before being allowed to drive minibuses with more than 8 passenger seats. Drivers who passed their UK driving test before 1st January 1997 hold provisional D1 entitlement and are eligible to drive minibuses in the UK with more than 8 passenger seats until their present licence expires. On University business, drivers eligible to drive minibuses must first receive familiarisation training by University recognised providers (Trent Training Ltd) and be formally approved by the Head of School on the University approved form (see *Safety Office Circular P12/99A*). No one will be allowed to drive a minibus without an Approved Drivers Permit endorsed for minibus use.

The minimum age for driving any minibus belonging to the University or hired by the University is 25. All drivers must have received familiarisation training by Ian Conway to facilitate the undertaking of daily checks on the roadworthiness of any minibus using the School's approved procedures and all drivers must fill in a School Minibus Log on a daily basis. The School has been granted a Small Bus Permit from the DETR, this must be displayed in the front of any minibus used on School business.
Prior to obtaining School approval all minibus drivers must watch the video "Safe Steps in Minibus Driving". Access to this video can be arranged through Ian Conway.

2.8 Supervision of Students

The duty to provide supervision of students' work activities to ensure their safety is delegated to the Head of School and subsequently to the members of staff directly responsible for the work (the supervisor). The purpose of this element of student supervision is to ensure that those activities with attendant risks are carried out in such a way that the precautions necessary are correctly applied (see *Safety Office Circular P2/94C*).

Effective supervision will be based on School procedures, systems of work and monitoring arrangements. In the case of postgraduate students the duty of the supervisor cannot be discharged solely by relying on the student's status or competence. Initial training of new postgraduate students in safe operating

procedures is an essential element of this duty. Induction training is provided in relation to the School Safety Policy and training in general laboratory safety is given by the Laboratory Manager.

Supervision itself is a flexible concept which varies from close and direct involvement with the student in the tasks whilst they are being learnt, to a more distant approach once competence is demonstrated, at which point it becomes a guiding and monitoring activity to ensure that deviation from the safe procedure is not occurring and that other hazards are not being introduced. Consequently, the supervisor will not be required to be directly present during the performance of all tasks although an awareness of the activities of the students under his or her control will be needed and they should be available. There will of course be some tasks in which the risks involved necessitate the direct presence of the supervisor to ensure their safe execution.

2.8.1 Undergraduate supervision

For routine undergraduate practical work the risks associated should have been minimised by the design of the experiment or task. The work should be carried out following the written protocol for that work. Supervision of the practical session will be by the responsible member of staff and/or appointed competent nominees for whom the staff will be responsible (e.g. teaching assistants). The extent to which direct task supervision will be needed will depend upon the residual risks of the work, i.e. those which cannot be minimised by the experimental design. The supervisory provision should be sufficient to allow monitoring of the group as a whole with an allowance for those elements where direct task supervision is needed so as to avoid dilution of the general supervision of the group. It is anticipated that these considerations will be broadly in line with the academic requirements for supervision.

For undergraduate projects the supervisor should ensure that the risks of the work have been assessed and that it complies with School procedures. The precautions necessary to prevent personal harm should be written down and explained to the student and copies of the risk assessment, displayed for consultation. These precautions should include those elements of the project where direct supervision of the task is needed for safety reasons and who will provide it.

Effective or adequate supervision does not mean that constant attendance by the supervisor is either necessary or usually required although he or she should be reasonably available. The supervisor should check that the student is following the correct procedures and that alterations are not introduced without consultation. The student should not work alone in the laboratory or undertake lone fieldwork (unless this is unavoidable during dissertation fieldwork and in this case, appropriate risk assessment has been undertaken and approved). The supervisor or authorised nominee will of course need to be in attendance where a greater degree of care is needed to prevent danger.

2.8.2 Application to postgraduate work

Those activities which have attendant dangers require risk assessments to be done (Management of Health & Safety at Work Regulations 1992). The risk assessment, having identified the hazards involved, how they can occur and the likely consequences, should specify the precautions to be taken to prevent danger. Where minor hazards are involved, such as where the worst consequences can easily be dealt with by first-aid, and where the precautions are simple to use, then

comprehensible written instructions or protocols would be sufficient. The supervisor should ensure that the student has been instructed in these and understands them. Adherence to these should also be monitored by the supervisor, for example from his or her direct observations from regularly seeing the student at work. The supervisor may also receive feedback from other staff (*e.g*. the Laboratory Manager) about the student's ability to work to the procedures.

Where the hazard could cause severe consequences, such as serious personal injury arising from loss of containment of toxic or flammable material, release of energy such as pressurised gas, ionising radiation or from dangerous machinery and where lack of knowledge or experience could cause an error to be made in applying the precautions, then the risk assessment should also specify the training and competence needed to perform the task. The complexity of the precautions also needs to be taken into account, since increased complexity could increase the likelihood of a failure to correctly apply them. If the work requires more than one person to be involved in it for safety reasons, then this should also be stated. Once the student has been trained in the safe performance of the task and has satisfied the supervisor of his or her competence, then the student could be authorised for this without direct supervision.

Research is a dynamic activity with the nature of the work and experimental technique changing as the work progresses. A "Project Supervisory Requirement Form" is provided to enable risk assessments, training and supervisory requirements to be formalised. These forms are available on the School's safety web page and act as a training record and a means for authorising the student to use the equipment or procedure in accordance with the protocol contained in the risk assessment. Forms should be updated by the supervisor as competence in these is demonstrated.

The following categorisation of the supervisory requirements should be used:

Category A

The task must be directly supervised;

Category B

The supervisor's advice and approval must be sought before the task is performed;

Category C

The work entails risks requiring careful attention to the safety related aspects of it and the student has been trained in the work and has demonstrated competence;

Category D

The risks are insignificant and carry no special supervision considerations.

These categories appear on the "Project Supervisory Requirement Form" but it is only really necessary to consider categories A to C. In the preparation of individual (separate) risk assessments, the supervisory category should be included. This should be the baseline category appropriate to someone inexperienced in the work.

The work can be re-categorised once the individual has become competent. Only category A and B work would need listing, with category C being a re-categorisation option to be used. Category D would be used in the risk assessments only as a way of confirming that the element has been considered. It is not relevant to this procedure which considers the major risks.

For example, a high risk activity would be categorised as A and subject to close task supervision whilst experience is being gained. Once competent, the person could in effect be authorised to take greater responsibility for the work which should be re-categorised by an amendment to that individual's project outline. The student could then perform that procedure without direct supervision subject to any other requirements of the risk assessment or School procedures such as "out of hours working". In many cases the work could be re-categorised from A to C. However, there are liable to be circumstances where closer control is still required because of the nature of the hazard and the potential for it being realised. A second competent person may be needed in attendance or a modification may be proposed and discussion with the supervisor on this will be needed. This would represent a change to category B. Where new or unforeseen procedures need to be carried out then the project outline should be similarly updated.

The list should be restricted to high risk activities as defined earlier since it is concerned with instances where a high level of task supervision is required. This should greatly limit the number of tasks which need to be included and facilitate updating as necessary.

"Project Supervisory Requirement Form". Both the student and the supervisor should retain a copy and both copies should be updated. In this way it serves to confirm to the student which asks are subject to certain restrictions.

The system described above could equally well be used to provide training for any new research workers, including visitors, research assistants and technicians. It is recommended that this is adopted unless there is already a similar system in place.

School of Geography Safety Policy Handbook

Authors: ML Clarke & I Conway Date of Last Revision: 13 February 2007

Head of School: Prof Charles Watkins

Signed: ..... Date: 6.01.07

PART 3: APPENDICES (Last Update, 4 December 2006)

Appendix I: Staff currently trained in First Aid in the School

Name:	Room:	Telephone:
Prof M L Clarke	B25	15446
Mr I Conway	A30a/workshop	15499
Dr R E Dugdale	A6	15437
Dr G H Endfield	B19	15731
Dr R Field	B21	66146
Prof M Heffernan	B26A	66144
Dr S Jewitt	B26b	15450
Prof A Leyshon	B24	66147
Prof D Matless	A4	15436
Mr G Morris	B28	15457
Dr N Mount	A17	15438
Ms T Needham	A30	67831
Dr G Priestnall	A18	15443
Dr S Seymour	A10	15453
Prof M Smallman-Raynor	A13	15427
Prof M D Steven	A16	15442
Dr A Swain	A12	15730
Prof C R Thorne	B26f	15431
Prof C Watkins	A5	15439

Appendix II: Approved Minibus Drivers in the School

Name:	Room:	Telephone:
Dr P Aplin	A8	66210
Prof M L Clarke	B25	15446
Mr I Conway	A30a/workshop	15499
Dr R Dugdale	A6	15437
Dr M J McCullagh	A43	15341
Dr S McGowan	A26b	15451
Ms T Needham	A30	67831
Dr G Priestnall	A18	15443
Prof M Smallman-Raynor	A13	15427
Prof M D Steven	A16	15442
Prof C R Thorne	B26f	15431
Ms E Watts	A35	15456