# Diving Procedures Manual

## Emergency Contacts

<table>
<thead>
<tr>
<th>Category</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flinders University Security (24hrs)</td>
<td>08) 8201 2880</td>
</tr>
<tr>
<td>University Diving Officer</td>
<td>Matt Lloyd – 0414 190 051 or 8201 2534</td>
</tr>
<tr>
<td>Faculty Diving Administrators</td>
<td>Charlie Huveneers (S&amp;E) – 0405 635 257 or 8201 2825</td>
</tr>
<tr>
<td></td>
<td>John Naumann (EHL) – 0427 427 179 or 8201 5533</td>
</tr>
<tr>
<td>Associate Director, WHS</td>
<td>0414 190 024</td>
</tr>
<tr>
<td>WHS Unit (during office hours)</td>
<td>08 8201 3024</td>
</tr>
<tr>
<td>Diving Emergency Service</td>
<td>1800 088 200</td>
</tr>
<tr>
<td>Ambulance/Police</td>
<td>000 (112 on mobile)</td>
</tr>
<tr>
<td>SES</td>
<td>132 500</td>
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<tr>
<td>Marine Radio</td>
<td>UHF 1</td>
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<td>VHF 16</td>
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OVERVIEW

Flinders University is committed to continuously improving the management and standards of Occupational Health and Safety, and this extends to minimising the risks associated with diving activities. This document describes the procedures, qualification criteria, and regulations that control snorkelling and SCUBA diving for any University diving activity. This includes any situation where divers are involved in projects authorised by Executive Deans or Deans of School. This includes students who are involved in diving as a formal part of a University course, or in any situation where University equipment or vessels are used in diving activities (This applies to vessels owned or chartered by the University).

This manual is intended to provide Flinders University personnel with a safe work procedure for the conduct of scientific diving using SCUBA or snorkelling in-line with the requirements of work health and safety legislation related to diving and guided by the Australian Standards for Occupational Diving Part 2 Scientific Diving (AS/NZS 2299.2).

The University undertakes only non-commercial, scientific and media diving for research and educational purposes and conducts only general diving and limited diving (see Appendix F for definitions).

All workers, students and visitors are required to comply with this manual. This manual has been compiled with regard to work health and safety legislation. The appendix at the back of the manual explains how the University system aligns with the requirements of the legislation. The manual should be regarded as the minimum standards required to ensure safe and efficient diving operations.

Relevant legislation, the Code of Practice and Australian Standards should be checked on a regular basis for updates.

References

- Australian Institute of Marine Science, Diving Procedures Manual, May 2014
- DCIEM Diving Manual - Part 1: Air Decompression Procedures and Tables
- AS/NZS 2299.1:2007 Occupational Diving Operations Standard Operational practice Supplementary
- AS/NZS 2299: Diving Medical Examination Forms
- AS/NZS 2299.2:2002 Scientific Diving
- AS/NZS 2299.3:2003 Recreational industry diving and snorkelling operations
- AS/NZS 2299.4:2004 Film and photographic diving
- AS2815.1 2008 Training and certification of occupational divers - Occupational SCUBA diver - Standard
- AS2815.2: 2013 Training and certification of occupational divers - Surface supplied diving to 30m
- AS2030.1: 2009 Gas cylinders - General requirements.
- AS2030.5: 2009 Gas cylinders - Filling, inspection and testing of refillable cylinders.
- AS2030.5: Amdmt 1-2015 Gas cylinders - Filling, inspection and testing of refillable cylinders.
- AS3848.2: 1999 Filling of portable gas cylinders - Filling of portable cylinders for self-contained underwater breathing apparatus (SCUBA) and non-underwater self-contained breathing apparatus (SCBA)
- Tasmanian Department of Primary Industry and Fisheries, Diving Procedures Manual, 1997
- University of Queensland, Heron Island Research Station Diving Procedures Manual
- University of Western Australia - Code of Practice for Underwater Diving
- Haddock, Steven H.D. and Heine, John N., Scientific Blue-Water Diving, 2005
- South Australian Research & Development Institute, Diving Procedures Manual, August 2007
Section 1 SCOPE AND RESPONSIBILITIES

1.1 Scope

The University undertakes non-commercial scientific (including archaeological and media) diving for purposes of research and/or educational activities. The University undertakes general and/or limited diving and does not operate commercial diving projects.

These procedures shall apply to all people involved in underwater in-water research and underwater teaching activities within the University. All divers and snorkelers (workers, students and visitors) must read and understand these procedures and adhere to them at all times.

The following activities are only permitted with the explicit written permission from the University Diving Officer (UDO) and either the Executive Dean or Dean of School. Applications for any such activities must be submitted via the Faculty Diving Administrator

- Diving to depths of greater than 21 metres
- Diving with gas mixtures other than air (including in water decompression using oxygen)
- Use of re-breather equipment or other equipment not open circuit SCUBA.

1.2 Responsibilities

Under work health and safety legislation, the University must ensure that the risks associated with diving work are managed.

All persons involved in diving are responsible for ensuring that they do so in accordance with this Manual and the University Diving Safety Policy to ensure safe and efficient diving activities are undertaken.

1.2.1 Vice Chancellor

The Vice-Chancellor has overall responsibility to provide a healthy and safe workplace for workers and students, including ensuring that the University meets its legislative responsibilities in relation to diving, including the appointment of a University Diving Officer.

1.2.2 Executive Deans

Executive Deans are responsible and accountable for work health and safety within their areas and have the authority to fulfil those responsibilities.

The Executive Dean of a Faculty where diving activities take place is specifically responsible for:

- ensuring the University Diving Safety Policy and the requirements of the University Diving Procedures Manual are implemented and complied with.
- appointing a Faculty Diving Administrator (FDA) for the Faculty. This appointment will be in writing and can be an FDA from another area.

1.2.3 Deans of School

Responsible and accountable for diving activities in their School, including:

- approving all dive plans and associated field trip documentation after the University Diving Officer (UDO) has given approval on the Dive Plan, prior to commencement of all diving activities;
- ensuring that a Dive Coordinator is appointed for each dive;
• as required, nominating a Senior Dive Coordinator as a site or project dive manager for a particular dive site, research group or project;

• ensuring that adequate resources are maintained at the School level to support safe diving activities;

• ensuring that the Executive Dean and the WHS Unit are aware of all diving activity being undertaken by the School by providing regular reports to the Faculty Health and Safety Committees;

• ensuring that all School dive records are kept in accordance with the requirements set out in this Manual; and

• meeting any responsibilities in relation to maintaining a safe research environment as set out in the Policy on Research Practice1.

1.2.4 University Diving Officer (UDO)

The University Diving Officer has the following responsibilities:

• undertaking an annual audit of diving practices in conjunction with the health and safety auditors to ensure compliance with the relevant standards;

• approving Dive Plans prior to any dive activity commencing;

• providing advice to Deans of School in relation to approval of dive plans prepared by the Dive Coordinator;

• providing advice to the relevant senior executives on all aspects of diving, including the implementation of the relevant Australian Standards;

• maintaining appropriate records, in accordance with the University Diving Procedures Manual;

• providing advice to Faculty Diving Administrators in relation to approval of dive plans prepared by Dive Coordinators as necessary;

• ensuring that Faculties maintain appropriate records in accordance with this Manual;

• undertaking regular reviews of diving activities in the University;

• ensuring that Executive Deans, Deans of School and the WHS Unit are provided with a summary report on diving activities annually; and

• ensuring that a suitable Dive Coordinator is present for each diving operation; and

• being familiar with any legislation, standards and guidelines that may apply to the University’s diving operations and ensuring compliance with this Manual.

1.2.5 Faculty Diving Administrators (FDA)

For each Faculty where diving activities take place, the Executive Dean will appoint (in writing) a suitably qualified and experienced individual as a FDA, with their agreement, to assist with diving

1 www.flinders.edu.au/manual/research/resprac.htm
management tasks. This can be a FDA from another area if the amount of diving is very small and short term.

*NB: An individual expected to act in a FDA role should have this recognised on their duty statement.*

Any nominated FDA will be expected to fulfil an important dive leadership role for the Faculty and be involved in the following tasks:

- Providing induction on the University manual for all Flinders University divers and record this on the Flinders University SCUBA / snorkel Induction & Statement of Understanding form.
- Providing additional induction when a Diver is promoted to a Dive Coordinator and record this on the Flinders University SCUBA / snorkel Induction & Statement of Understanding form.
- Evaluating fieldwork practices and conditions to ensure all diving is conducted to relevant standards and safety requirements, in accordance with this manual.
- Liaising with the UDO to ensure communication channels are implemented both ways between UDO and divers.
- Assisting divers with risk assessment, specifying hazard and controls in risk assessments, field trip arrangements and dive planning issues.
- Ensuring that all risk minimisation strategies resulting from the Risk Assessment are implemented.
- Ensuring that all required details and information is forwarded to the UDO in a timely manner as specified in this manual.
- Providing, organising, or advising on any further diver training for individuals, as appropriate.
- Supervising the use and periodic maintenance of all diving equipment under their control, and prohibiting the use of equipment which is past its service date, or which he/she considers unsafe.
- Maintaining records of any maintenance/repair of faculty diving equipment.
- Maintaining a diving equipment defects log recording any problems with Faculty/School equipment, the date of the problem, and the action taken to remedy the problem.
- Ensure that all Flinders University divers are aware of their responsibility to maintain an up to date service history of their personal diving equipment, which must be recorded and submitted annually to the FDA for inclusion on the Faculty Dive Register (Dive Register note & a copy kept in personal file).
- Coordinating formal training of Flinders University diving personnel in work related diving practices.
- Ensuring that divers are trained in the use of emergency and resuscitation equipment.
- Providing advice in consultation with the UDO on the purchase and procurement of all Faculty diving equipment.
- Where suitably qualified; to fill the position of “acting” UDO should the need arise.
• Providing advice to the UDO and University Associate Director, WHS and Field Trip contact person as soon as possible of any diving related injury or incidents that occurs to any member of a Dive Team; and ensure that all the required forms have been completed and submitted. (See Section 12 for details).

1.2.6 Dive Coordinators (DC)

A Dive Coordinator is the designated leader for the operation of Dive Teams. A designated Dive Coordinator must be present at every University diving operation, and may act as either a Surface attendant or as a diver during any dive. All Flinders University Dive Coordinators will be appointed in writing by the relevant Dean of School, in conjunction with approval from the UDO and FDA.

1.2.6.1. A Dive Coordinator must

• have adequate training and experience in accordance with the requirements of this manual, as well as experience with the operation of any equipment being used and any work being carried out during the diving operation. They are not required to hold a current dive medical if not diving.

• complete the Flinders University Dive Coordinator sections of the Flinders University SCUBA / Snorkel Induction & Statement of Understanding form. This information is to be provided to UDO to approve and recorded on the Faculty Dive Register by the FDA.

• maintain a fitness level appropriate to their position and duties.

• be at least 18 years of age and have suitable experience (as per table 2.2.5).

• be approved by FDA and endorsed by UDO and recorded on the Faculty Diver Register.

• attend an induction session administered by the UDO or FDA and which will be completed using Statement of Understanding and Induction form.

• have a minimum qualification in line with AS4005.2:2000 (e.g. Professional Recreational -Dive Leader qualification e.g. PADI Dive master or CMAS ‘3★’).

1.2.6.2 The Dive Coordinator for each dive trip is responsible for:

• undertaking all planning steps such as all the pre diving trip forms e.g. Dive Plan, Field Trip, Risk Assessment. The Dive Coordinator will provide these forms to the FDA a minimum of three (3) full working days prior to the commencement of the dive. The FDA is then responsible to submit the documentation to UDO.

• ensuring that all field trip planning (if also the Field Trip Leader), dive planning, and other documentation (during and after dive) is completed.

• ensuring that the Risk Assessment has been completed for the project to be undertaken, and contains specific notification of any planned dive profile/s containing one or more of the ‘higher risk factors’ described in Section 11 ‘Diving Risk’, or any similar factors.

• ensuring that all forms signed by the FDA and the UDO are submitted to the Dean of School for approval prior to the dive commencement.

• ensuring that all individuals to be involved in the operation have sufficient training and experience to safely perform all required tasks, including having dived within the past 6 months and are registered on the Faculty Diver Register.

• ensuring all required safety equipment is available and taken on the trip.

• checking in with the UDO and/or nominated contact at a designated time each day.
• ensuring every diving operation is performed in accordance with the plan as far as possible, or notifying the UDO of any major changes, ahead of the dive. Any changes must be recorded on the Daily Dive / Snorkel Log form.

Dive Coordinator must also:

• conduct on site pre-dive briefings: This on-site briefing MUST occur in the presence of the entire Dive Team (including Surface attendants, Boat Handlers and Divers) and include discussion of all required control measures - in particular where any dive operation contains one or more of the high risk factors, refer to Section 11 ‘Diving Risk’. An example of a Pre-dive briefing is available on the WHS web site.

• ensure every diver is fully aware of their particular tasks for the dive, including knowing which other diver/s they are to act as a buddy for.

• nominate a suitably qualified in-water Dive Leader for each Dive Team for each dive.

• nominate a suitably qualified Surface attendant as topside support in the event the Dive Coordinator intends to dive. A Surface attendant must be qualified to undertake the required duties.

• restrict or suspend any operation considered unsafe while in the field - with particular attention to weather forecasts and sea state.

• ensure that at every dive site there are adequate means of communication in case of emergency (ie. radio and/or mobile phone).

• ensure that a Daily Dive / snorkel Log form for every dive is kept, listing all relevant dive details and is signed as required for each dive.

• complete the Post Dive section on the Daily Dive/ snorkel Form and give this to the FDA as soon as practicable and no later than 1 month of conclusion of the dive project unless another time frame has been agreed to on dive plan.

• notify the UDO as soon as possible of any diving-related injury or incident that occurs to any member of the Dive Team, completing an accident/incident report form (if the Internet is available then ‘FlinSafe’ can be used) if the injured person is unable to do so and taking witness statements from all present. These forms must be submitted to the UDO and the WHS Unit Manager (0414190024) as soon as possible. The equipment and situation must be secured for investigation.

1.2.7 Dive Leader

A Dive Leader is a person in charge of a specific part of a diving operation under water. Where two or more divers are in the water at one time, one shall be assigned the role of the Dive Leader by appointment from the Dive Coordinator.

The Dive Leader (if not the Dive Coordinator) shall be the person most qualified/experienced for the conditions, tasks and equipment of the planned dive.

1.2.8 Divers

All Divers must:

• be appropriately trained and listed as current in the Faculty Dive Register maintained by the FDA.

• ensure that they are medically and physically fit for each dive.

• ensure they are familiar with, understand and comply with the provisions of this Manual.

• comply with the instructions of the Dive Coordinator/Dive Leader.

• maintain an up to date personal Dive Log Book.
• record and sign dive details on the Daily Dive / Snorkel log form and submit to the Dive Coordinator at the end of each day.

• monitor air supply and ensure all SCUBA dives are completed with no less than 50 bar of air remaining in SCUBA tank on surfacing.

• ensure diving is conducted well within the ‘No-Deco’ limits of the DCIEM Tables, (See Appendix D of this manual).

• ensure they have all equipment required by these procedures, and conduct a functional check of equipment and record it on the Pre Dive Equipment Checklist by the Dive Coordinator or Diver’s Attendant.

• maintain contact with their dive buddy,

• monitor their own air supply, and inform their buddy at regular intervals of air status.

• not dive with any malfunctioning equipment, and report any equipment fault to their Dive Coordinator and FDA.

• use all equipment in a correct and responsible manner for University purposes.

• report all hazards, incidents and injuries to the Dive Coordinator.

1.2.9 Surface Attendant

Any diver who goes underwater must be attended by a Surface Attendant unless the UDO and Dean of School has allowed a two person dive team (see Section 6.2.1) A Surface Attendant may be responsible for a maximum of 2 teams of divers at once. The Surface Attendant can directly monitor the divers either visually or with the assistance of surface marker buoys.

All Flinders University Surface Attendants must be at least 18 years of age.

The duties and responsibilities of a Surface Attendant include:

• having a complete working knowledge of the Dive Plan, and associated tasks.

• having training and knowledge of all signals in use.

• having training and knowledge of any dive tables in use, usually DCIEM.

• having training and knowledge of all plant and equipment in use.

• having training and knowledge of first aid and oxygen provision for diving except where a second person with such training and knowledge is present and remains at the surface.

• promptly and accurately filling in a ‘Daily Dive/ Snorkel Form’ for each diver as required.

• assisting with the deployment and recovery of divers, any work, tools and equipment as required.

• establishing and maintaining a constant look-out over any divers in the water.

A SURFACE ATTENDANT MUST NOT:

• leave the boat or shore at any time, to swim or snorkel, other than in an emergency.

• carry out any activities in the boat or on shore (such as reading, sleeping or fishing), which may divert their attention from the responsibilities set out above.
1.2.10 Master, Coxswain or Boat Handler

Where a boat is used the Boat Handler is a key member of the dive team. They are responsible for the safety of the boat and make decisions as to the suitability of the weather conditions for boat operations to be undertaken. Boat Handlers must hold the required operating certificate for the vessel in use. Where an exemption has been approved by AMSA, recreational boat licenses may be used in accordance with the exemption.

**Boat Handlers must be at least 18 years of age.**

The Boat Handler is responsible for:

- adhering to the University policy and guidelines for boats and boating activities (available at the following web address: [https://www.flinders.edu.au/whs/working-safely/boats.cfm](https://www.flinders.edu.au/whs/working-safely/boats.cfm)).
- ensuring safety equipment is loaded, and the boat has adequate fuel for the planned trip, including a minimum reserve of at least 30% of estimated requirements for the trip.
- ensuring safety equipment includes all 'survey' equipment - at least flares, oxygen resuscitation kit, first aid kit, a radio, a mobile phone, dive flag, fire extinguisher, spares and tool box.
- ensuring that the boat is trimmed for operation and all equipment is stowed safely.
- having a good working knowledge of boats and being ready and able to give adequate assistance quickly in an emergency.
- being in charge of the boat during travel to and from the dive site, and maintaining position at the dive site - usually by anchoring. Inexperienced Boat Handlers must not manoeuvre a vessel whilst divers are in the water, except in emergency.
- displaying the appropriate dive flags and signals while diving operations are taking place.
- deploying a current line as appropriate, once the boat is anchored securely.
- maintaining radio communications with a research station, mother ship or shore base as required.

**IMPORTANT NOTE:** except in case of emergency, no individual shall work a vessel 'live' (see Glossary, Appendix A) whilst divers are in the water without prior approval from the UDO & Dive Coordinator.

1.3 Unsatisfactory or inappropriate behaviour

Should the UDO, FDA or Dive Coordinator/Leader have concerns as to whether an individual has adhered to the University's Diving Procedures Manual, he/she should discuss the concerns with the individual in the first instance.

The individual's supervisor and the UDO should be informed if the matter is of a serious or repeated nature, or where the matter has been unable to be resolved at the site level. In this event, the Dean of School and the individual’s supervisor and the UDO will investigate the circumstances. In undertaking the investigation, the Dean of School, Supervisor and UDO may also discuss the matter with the WHS Unit. The Dean of School and Supervisor will determine if a formal report is to be made in accordance with the relevant Policy.
1.4 Disciplinary Action

Disciplinary action may be taken in accordance with the relevant University policy should unsafe diving or boating activities occur.

The University Policies on disciplinary action in relation to both academic and professional staff may be seen at http://www.flinders.edu.au/ppmanual/staff/discipline/index.cfm

Disciplinary action in relation to students is covered by Statute 6.4 Student Conduct. The Policy and Procedures relating to Student Conduct may be seen at http://www.flinders.edu.au/ppmanual/student/student-conduct.cfm.
Section 2     PERSONNEL FOR DIVING OPERATIONS

2.1 General Requirements
All individuals seeking to engage in diving activities under the auspices of Flinders University must apply to their FDA for listing on the Faculty Diver Register by forwarding the following:

- A completed Flinders University SCUBA/Snorkel Diver Registration Form.
- Copies of their relevant diving qualifications, first aid and oxygen qualifications.
- Copies of their diving logbooks.
- A full safety induction with the FDA. This is to be recorded in the induction section of the Flinders University SCUBA/ Snorkel Induction & Statement of Understanding.
- A copy of a current diving medical form (adherent to AS2299.1 Supplementary AS/NZS 2299: Diving Medical Examination Forms). (For doctors qualified to perform this medical, see the list of South Australian Medical Facilities & “Diving Doctors” on the South Pacific Underwater Medicine Society website http://www.spums.org.au/diving-doctors-commercial).

Divers should note the following:

- After being listed on the Faculty Diver Register, and before diving takes place, individuals must familiarise themselves with this University Diving Procedures Manual and the short form DCIEM air decompression tables, Appendix D.
- Divers must sign a copy of the Flinders University SCUBA/ Snorkel Induction & Statement Of Understanding - which must be forwarded to the UDO and filed by the FDA.
- All divers are responsible for maintaining a high level of knowledge and competence regarding the type/s of diving they undertake, as well as knowledge of diving equipment in use.
- All diving personnel must maintain a level of physical fitness commensurate with the type of diving operation/s in which they are likely to be involved whilst at the University.
- Divers should aim to participate in at least one diving operation approximately every three (3) months, to maintain their skills and knowledge.
- Divers who have not been diving within a six (6) month period shall not dive until the FDA and UDO have given approval. For divers recovering from a medical condition, operation or pregnancy a new, current dive medical, dated after their recovery period and a competency assessment may be required, at the discretion of the FDA or UDO.

2.2 Diving Medicals

Divers must have a good medical history and some reserves of cardiovascular fitness and toughness. The University maintains its formal duty-of-care by ensuring people start their careers diving medically fit and they keep the medical up-to-date yearly.

A dive medical performed by a doctor with training in diving or hyperbaric medicine is required before diving or snorkelling for work or research with Flinders University.

Diving medicals are different for different categories of divers:

- Occupational or Commercial Dive medical from the Australian Standard AS2299.1 is the most common medical required. We work in open circuit SCUBA and so other levels of commercial diving and types are not required.
- Recreational Dive medical from the standard AS4005.1 is for snorkelers and occasional volunteer divers only.
A copy of a current diving medical form (adherent to AS2299.1 Supplementary AS/NZS 2299: Diving Medical Examination Forms) must be filled in by the diver applicant, the diving doctor and then returned to the Faculty Dive Administrator.


International equivalents will generally be professional or occupational or commercial diver medical examinations (i.e. not self-certification and not recreational dive medicals). International and visiting divers should contact the relevant FDA for more details on how to obtain the proper medical outside Australia.

In general a dive medical suitable for University work and SA WHS Regulations 2012 must follow;

**169—Certificate of medical fitness**

A certificate of medical fitness must—

(a) be issued by a registered medical practitioner with experience in dive medicine or underwater medicine; and

(b) state the following:

(i) the name of the person to whom it is issued;

(ii) its date of issue and its expiry date;

(iii) whether or not the person to whom it is issued is, in accordance with the fitness criteria, medically fit to carry out diving work;

(iv) any conditions in relation to the type of diving work the person to whom it is issued is fit to carry out, or the circumstances in which the person is fit to carry out general diving work, including, in the case of a person who is under 18 years of age, any particular conditions applicable to the age of the person.

If the individual is a snorkeler (only) or a volunteer, a Recreational Diving Medical form (available from a Diving Doctor, on SPUMS website or from one of the FDAs) must be completed as a minimum. (a certificate of medical fitness in accordance with Regulation 169 above is of course acceptable too).

### 2.3 Diver Classification and Training Requirements

Divers are classified into categories based on qualification, experience and role. Individuals who intend to participate in diving operations using compressed air as a part of the University must fulfil all listed requirements of this Manual for the level of classification which they apply. They will be classified by the UDO or FDA based on their qualifications and experience, as well as the UDO or FDA assessment of their abilities.

The minimum training and experience required for each classification are listed below.

#### 2.3.1 Snorkelers

<table>
<thead>
<tr>
<th><strong>Snorkel</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recreational Diving Medical (AS 4005.1) [or Occupational Dive Medical (AS.2299.1)] A certificate of medical fitness must—(a) be issued by a registered medical practitioner with experience in dive medicine or underwater medicine; see SA WHS Reg. 169</td>
</tr>
<tr>
<td>• Diver Registration Form</td>
</tr>
<tr>
<td>• Read and understand the ‘Diving Procedures Manual’</td>
</tr>
<tr>
<td>• Induction &amp; Statement of Understanding form signed</td>
</tr>
<tr>
<td>• ‘Provide First Aid’ HLTAID003 (within 6 months) renewed 3 yearly</td>
</tr>
<tr>
<td>• Commence a logbook</td>
</tr>
<tr>
<td>• <strong>5 hours</strong> snorkel experience</td>
</tr>
<tr>
<td>• Breath hold depth limit is less than 5 m</td>
</tr>
</tbody>
</table>
### 2.3.2 Restricted Student Diver

<table>
<thead>
<tr>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Open Water SCUBA certification from a recognised training organisation</td>
</tr>
<tr>
<td>• <strong>15 hours AND 10 dives minimum</strong>, SCUBA experience (excludes open water course)</td>
</tr>
<tr>
<td>• Depth Limit less than 9 m</td>
</tr>
<tr>
<td>• Must dive with Dive Coordinator or General Scientific Diver as in-water supervisor</td>
</tr>
<tr>
<td>• A certificate of medical fitness must—(a) be issued by a registered medical practitioner with experience in dive medicine or underwater medicine; see SA WHS Reg. 169 Occupational Dive Medical (AS.2299 medical or equivalent) renewed every 12 months.</td>
</tr>
<tr>
<td>• Maintain fitness to dive (i.e. dived recently, no recent sickness)</td>
</tr>
<tr>
<td>• Diver Registration Form</td>
</tr>
<tr>
<td>• Read and understand this ‘Diving Procedures Manual’</td>
</tr>
<tr>
<td>• Use DCIEM tables</td>
</tr>
<tr>
<td>• Induction &amp; Statement of Understanding form signed.</td>
</tr>
<tr>
<td>• ‘Provide First Aid’ HLTAID003 renewed 3 yearly</td>
</tr>
<tr>
<td>• Divers Oxygen provider [DAN] (within 6 months) renewed with CPR every 12 months</td>
</tr>
<tr>
<td>• Up-to-date logbook</td>
</tr>
</tbody>
</table>

### 2.3.3 Volunteer Diver (who does occasional dives)

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recreational Diving Medical (AS 4005.1) [or Occupational Dive Medical (AS.2299.1)]</td>
<td>• Open Water SCUBA certification from a recognised training organisation</td>
</tr>
<tr>
<td>• Diver Registration Form</td>
<td>• <strong>15 hours AND 10 dives minimum</strong>, SCUBA experience (not including open water training)</td>
</tr>
<tr>
<td>• Read and understand the ‘Diving Procedures Manual’</td>
<td>• Depth Limit less than 9 m</td>
</tr>
<tr>
<td>• Induction &amp; Statement of Understanding form signed</td>
<td>• Must dive with Dive Coordinator or General Scientific Diver as in-water supervisor</td>
</tr>
<tr>
<td>• Commence logbook</td>
<td>• Recreational Diving Medical AS4005 or Occupational Dive Medical AS.2299 medical (renewed every 12 months)</td>
</tr>
<tr>
<td>• <strong>5 hours</strong> snorkel experience</td>
<td>• Diver Registration Form</td>
</tr>
<tr>
<td>• Duck-dive depth limit &lt; 5 m</td>
<td>• Read and understand the ‘Diving Procedures Manual’</td>
</tr>
<tr>
<td></td>
<td>• Use DCIEM tables</td>
</tr>
<tr>
<td></td>
<td>• Induction &amp; Statement of Understanding form signed</td>
</tr>
<tr>
<td></td>
<td>• Up-to-date logbook</td>
</tr>
<tr>
<td></td>
<td>• Maintain fitness to dive</td>
</tr>
</tbody>
</table>
### 2.3.4 Incidental Scientific Diver

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
</table>
| • Recreational Diving Medical (AS 4005.1) or Occupational Dive Medical (AS.2299.1)  
• Diver Registration Form  
• Read and understand the ‘Diving Procedures Manual’  
• Induction & Statement of Understanding form signed  
• ‘Provide First Aid’ HLTAID003’ (within 6 months) renewed 3 yearly  
• Commence logbook  
• 5 hours snorkel experience  
• Breath hold depth limit less than 5 m | • Open Water SCUBA certification (or equivalent experience) from a recognised training organisation  
• Occupational Dive Medical AS.2299 medical renewed every 12 months.  
• 15 hours AND 10 dives minimum, SCUBA experience (not including open water training.)  
• 5 dives following scientific dive procedures (with Flinders University or equivalent institution/organisation)  
• Depth Limit less than 9 m  
• Diver Registration Form  
• Read and understand this ‘Diving Procedures Manual’  
• Use DCIEM tables  
• Induction & Statement of Understanding form signed.  
• ‘Provide First Aid’ HLTAID003 renewed 3 yearly, (within 6 months)  
• Divers Oxygen provider [DAN] (within 6 months) renewed with CPR every 12 months  
• Logbook  
• Must dive with Dive Coordinator or General Scientific Diver as an in-water supervisor.  
• Maintain fitness to dive (i.e. dived recently, no recent sickness) |
### 2.3.5 Limited Scientific Diver

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Diver Registration Form</td>
<td>• Advanced Open Water SCUBA certification (or equivalent experience)</td>
</tr>
<tr>
<td>• Read and understand the 'Diving Procedures Manual'</td>
<td>• Minimum <strong>60 hours</strong> diving and authorised at the discretion of UDO</td>
</tr>
<tr>
<td>• Induction &amp; Statement of Understanding form signed</td>
<td>• <strong>5 dives</strong> following scientific dive procedures</td>
</tr>
<tr>
<td>• ‘Provide First Aid’ HLTAID003</td>
<td>(with Flinders University or equivalent institution/organisation)</td>
</tr>
<tr>
<td>• Logbook</td>
<td></td>
</tr>
<tr>
<td>• <strong>5 hours</strong> snorkel experience</td>
<td>• Depth Limit less than 21 m</td>
</tr>
<tr>
<td></td>
<td>• Occupational Dive Medical (AS.2299 medical) renewed every 12 months</td>
</tr>
<tr>
<td></td>
<td>• Close international equivalent.</td>
</tr>
<tr>
<td></td>
<td>• Diver Registration Form</td>
</tr>
<tr>
<td></td>
<td>• Read and understand this Procedures Manual'</td>
</tr>
<tr>
<td></td>
<td>• Use DCIEM tables</td>
</tr>
<tr>
<td></td>
<td>• Induction &amp; Statement of Understanding form signed</td>
</tr>
<tr>
<td></td>
<td>• Current ‘Provide First Aid’ HLTAID003</td>
</tr>
<tr>
<td></td>
<td>• Divers Oxygen provider [DAN] renewed with CPR every 12 months</td>
</tr>
<tr>
<td></td>
<td>• Up-to-date logbook</td>
</tr>
<tr>
<td></td>
<td>• Able to be a Dive Leader under the control of dive coordinator</td>
</tr>
</tbody>
</table>

### 2.3.6 General Scientific Diver

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recreational Diving Medical (AS 4005.1) or Occupational Dive Medical (AS.2299.1)</td>
<td>• Professional Dive Leader Qualification (AS/NZS 4005.2.2000; e.g. PADI, NAUI or FAUI Divemaster or equivalent, or higher )</td>
</tr>
<tr>
<td>• Diver Registration Form</td>
<td>• OR any Occupational Diver Qualification (AS/NZS 2815)</td>
</tr>
<tr>
<td>• Read and understand the ‘FU Procedures Manual’</td>
<td>• Minimum <strong>100 hours</strong> diving and authorised at the discretion of UDO</td>
</tr>
<tr>
<td>• Induction &amp; Statement of Understanding form signed</td>
<td>• Minimum <strong>20 dives</strong> following scientific dive procedures (with Flinders University or equivalent institution/organisation)</td>
</tr>
<tr>
<td>• Current ‘Provide First Aid’ HLTAID003</td>
<td>• Depth limit 21m (but after approval can dive to 30 m)</td>
</tr>
<tr>
<td>• Logbook</td>
<td>• Occupational / commercial Dive Medical (AS.2299); medical renewed every 12 months – designated ‘Fit-to-dive’</td>
</tr>
<tr>
<td>• Must have <strong>10 hours</strong> snorkelling experience as part of Flinders University program or equivalent.</td>
<td>• Diver registration form</td>
</tr>
<tr>
<td>• Any Dive Qualification</td>
<td>• Use DCIEM tables</td>
</tr>
<tr>
<td>• ‘Provide First Aid’ HLTAID003</td>
<td>• ‘Provide First Aid’ HLTAID003 renewed 3 yearly.</td>
</tr>
<tr>
<td>• Divers Oxygen provider [DAN] renewed with CPR every 12 months.</td>
<td>• Divers Oxygen provider [DAN] renewed with CPR every 12 months.</td>
</tr>
<tr>
<td></td>
<td>• Up-to-date logbook</td>
</tr>
</tbody>
</table>
### 2.3.7 Faculty Dive Administrator (FDA)

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Experienced professional Dive Leader (AS/NZS 4005.2.2000; eg. PADI Divemaster or equivalent, or higher)</td>
</tr>
<tr>
<td></td>
<td>• <strong>OR</strong> any Occupational Diver Qualification (AS/NZS 2815)</td>
</tr>
<tr>
<td></td>
<td>• Fulfils all obligations to be designated ‘General Scientific Diver’ and ‘Dive Coordinator’.</td>
</tr>
<tr>
<td></td>
<td>• 20 dives with Flinders or equivalent plus <strong>100</strong> dives total</td>
</tr>
<tr>
<td></td>
<td>• Appointed by formal process by the Faculty Executive Dean, Dean of School and UDO.</td>
</tr>
</tbody>
</table>

### 2.3.8 University Diving Officer (UDO) or Acting UDO

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Suitably experienced; e.g. SCUBA Instructor, Commercial, Occupational or Scientific Diver or equivalent who meets the criteria of the position description.</td>
</tr>
<tr>
<td></td>
<td>• Able to supervise all diving including “High Risk” diving.</td>
</tr>
<tr>
<td></td>
<td>• More than <strong>20</strong> dives with Flinders or equivalent plus <strong>100</strong> dives total</td>
</tr>
<tr>
<td></td>
<td>• Appointed by the University</td>
</tr>
</tbody>
</table>

### 2.3.9 Surface Attendant

<table>
<thead>
<tr>
<th>Snorkel</th>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Current Oxygen, First Aid certificates, unless a second person on surface has them</td>
<td></td>
</tr>
<tr>
<td>• Working knowledge of signals</td>
<td></td>
</tr>
<tr>
<td>• Working knowledge of diving equipment and use</td>
<td></td>
</tr>
<tr>
<td>• Complete working knowledge of Dive Plan and emergency procedures</td>
<td></td>
</tr>
<tr>
<td>• Current Oxygen, First Aid certificates, unless a second person on surface has them</td>
<td></td>
</tr>
<tr>
<td>• Working knowledge of signals</td>
<td></td>
</tr>
<tr>
<td>• Working knowledge of diving equipment and use</td>
<td></td>
</tr>
<tr>
<td>• Complete working knowledge of Dive Plan and emergency procedures</td>
<td></td>
</tr>
</tbody>
</table>
2.3.10 Visiting Research Personnel

Visiting research personnel must submit their certifications and logged dives well in advance of their arrival at the University to allow for assessment and registration.

<table>
<thead>
<tr>
<th>SCUBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Recognised Open Water SCUBA diving certification (or higher)</td>
</tr>
<tr>
<td>• Current diving medical (not more than 12 months old, using their local professional dive medical form from their diving physician or GP, or one done in Australia to Australian standards)</td>
</tr>
<tr>
<td>• Sufficient diving experience to be able to do the research required, to a level acceptable to the UDO (generally more than 60 hours of diving)</td>
</tr>
<tr>
<td>• Accompanied by a General Scientific Diver initially.</td>
</tr>
</tbody>
</table>

2.3.11 Determination of classification

The UDO will determine the classification based on the diver's qualifications and experience and with advice from the FDA. A final determination may be made after a check-out dive (This dive is to be recorded on daily dive log) and at the discretion of the UDO.

The UDO or FDA has the right to assess any scuba diver new to the Dive Register, and a formal assessment test using the New Diver Evaluation form as determined by the UDO or FDA. A Dive Coordinator may assist in the assessment of divers and so may support the FDA in undertaking a group check-out dive.

- Minimum training and experience required for each classification are listed in section 2.3. Until such time as these requirements are met (or at the discretion of the UDO or FDA with regard to a diver's experience), a new diver (for any type of equipment) must be accompanied by a qualified Dive Coordinator or General Scientific Diver.

- A Restricted Student Diver will likely be limited in the tasks they can perform whilst diving underwater. This may be instructed by the UDO, FDA or Dive Coordinator.

2.4 Proof of Diving Experience, and Exceptions

Divers without a logbook claiming to have the required experience for listing on the Faculty Diver Register will only be permitted to dive on a case-by-case basis and at the discretion of the UDO. To be permitted, the person must first submit a signed statement outlining their diving experience.

Staff and students with fewer than the required hours of diving experience may be allowed to dive at the discretion of the UDO, subject to the following:

- A skills based check out dive to be completed; and

- An experienced General Scientific Diver must be a dedicated in-water supervisor.

2.5 ‘Work up’ Dives

At the discretion of the UDO or FDA, divers who have not dived for an extended period of time (e.g. 6 months or more), or those who wish to dive to increased depths, may be required to perform a series of ‘work up’ dives.
2.6 Fitness to Dive

All personnel who have successfully passed an annual occupational/commercial diving medical examination AS2299 will generally be classed as “fit to dive”. However, the physical ability of an individual to act in any role or perform a task can only be determined by that individual on the day of a dive and the Dive Coordinator.

Each individual is responsible for notifying the UDO and FDA of any medical condition or injury that may have commenced/occurred to them since the date of their last medical, and which would increase their level of risk if they undertook a dive. If an individual decides they are fit to dive, then their fitness may be further assessed by the Dive Coordinator on site, or by the UDO or FDA at any time, with any of those individuals able to veto any dive if they see fit.

The Dive Coordinator on site MUST prohibit diving by any individual if that person’s physiological or psychological state has been altered, or appears to have been altered, by illness, fatigue, injury, intoxication, or loss of coordination from the effects of prescription drugs or other substances.
Section 3  ADMINISTRATION

3.1 University Diver Register and Registration

All individuals intending to operate as divers through Flinders University must submit the information as required in section 2.1 to the FDA and UDO for consideration and must apply for admission to the Faculty Diver Register.

- Application to dive with the University must be received no later than ten (10) working days prior to the intended date/s of any dive/s, and must provide all relevant details of the intended diving operation and include all information required by this Manual. Details should be completed on the University SCUBA/ Snorkel Dive Registration form.

- All details provided are to be logged on the Register, which shall be kept updated by the FDA with regard to currency of qualifications, dive medical status and equipment test status.

- Copy of all dive qualifications and Log book(s) (including the last 15 hours undertaken) must be provided for sighting, copied and recorded on diver’s personal files.

- Divers must notify the UDO and FDA of any medical condition or injury that may have commenced/occurred to them since the date of their last medical, and which would increase their level of risk if they undertook a dive.

- Divers must familiarise themselves with this Diving Procedures Manual, undergo an induction fully describing all relevant safety protocols and issues, and sign a copy of the Flinders University SCUBA/ Snorkel Induction & Statement Of Understanding. This form must be forwarded to the FDA and UDO to confirm listing on the Faculty Diver Register.

The FDA should endeavour to remind all divers of upcoming expiry dates, giving at least 1 month notice of these, to allow time for renewal. Notwithstanding this, individual Divers are responsible for keeping track of these dates, to ensure they are current on the Faculty Diver Register. The UDO has discretion to offer 2 months extension for extenuating circumstances.

The FDA should provide the UDO with updated copies of the Diver Register on a six monthly basis. The following information should be maintained by the FDA for each diver in their faculty on the Diver Register:

- Name, DOB, address and next of kin information;

- Details of diving qualifications, and due date for renewal of diving qualifications (if applicable);

- Details of employment status (i.e. staff, volunteer, external agency etc.) and base of operations;

- Flinders University diver classification – allocated by UDO/FDA.

- Date of most recent diving medical and due date for renewal of diving medical.

- Agency from which first aid qualifications were obtained, ID #, and due date for renewal;

- Details of any personal diving equipment used and due date for renewal of test certification for any such equipment.

- Details of any other certification held. e.g. coxswains ticket, radio operator certification etc.

- Other relevant comments.
3.2 Record Keeping Responsibilities

3.2.1 UDO and FDA Responsibilities

The UDO provides oversight of the University record keeping. However, the FDA is responsible for filing and keeping records for at least seven (7) years on the Faculty Dive Register:

Records that must be kept include:

- Details of all divers involved Flinders University diving operations and records of evidence used to assess the diver's diving competencies and fitness.
- Each approved University diving operation.
- Evidence of servicing of all equipment used for Flinders University diving operations (including private) all equipment defects and how these were dealt with.
- Any incidents and accidents.
- Any other relevant details as specified in this manual.

Note - Medical Records and Accident / Incident reports must be kept as a permanent record.

3.2.2 Diver’s Responsibilities

All divers must keep and maintain a permanent log of all diving undertaken for the University, which must include:

- The diver’s photograph.
- Next of kin information.
- The diver's name, address, DOB and signature.
- A record of medical examinations conducted for the purpose of occupational diving.
- A record of Flinders University diving activity undertaken.
- A record of any relevant accidents or incidents including decompression treatment/s.
- The record of each dive must be signed by the Dive Coordinator for all divers present at each particular dive.
- The diver’s logbook shall be presented at each diving medical examination for signature by the diving doctor. It must be made available to the UDO on request.

3.3 Forms

All diving forms are available on the WHS website and are listed in Appendix I.
Section 4 FIELD TRIP AND DIVE PLANNING AND CONDUCT OF DIVING OPERATIONS

4.1 Field Trip

The Dive Coordinator must complete the Flinders University Field Trip forms.

The Field Trip Procedures and Guidelines are intended to assist in the preparation for a field trip to ensure safety of all participants. (see the WHS web site: https://www.flinders.edu.au/whs/working-safely/field-trips.cfm)

4.2 Dive Plan

For every diving operation the Dive Coordinator must complete a Flinders University Dive Plan and submit this to the FDA as the first stage of the approval process.

The Dive Plan must:

- build in extra safety margins where any identifiable factors are present or likely to be present, which may increase the risk of DCI during a dive. This is particularly important if diving in areas away from a recompression facility.

- be discussed with their University Supervisor and the FDA before submitting the plan. The Plan is then submitted to the UDO and Dean of School for approval.

- be submitted with sufficient time given to adopt any changes required by the UDO & the FDA. This must be a minimum of three (3) full work days before the first dive listed on the form.

- be discussed in detail by the Dive Coordinator at an pre-dive briefing on site (see 4.3.2), with all divers and support personnel present.

The Dive Coordinator must ensure the Dive Plan has been signed by the UDO and the Dean of School before starting a diving operation.

4.3 On-site Operations

4.3.1 Daily Diving Risk Table

The conditions on site must be assessed on the day of the dive and recorded on the Daily on-site Risk Table form. An assessment must be made and recorded as to the suitability of the condition at the site which would allow for a safe dive to occur.

4.3.2 Mandatory On-Site Dive Briefing

To help ensure a successful diving operation, it is important that each member of the dive team understands the objectives of the dive and in particular that they understand their roles and the roles of all other members of the dive team during the dive.

A dive briefing, normally conducted by the Dive Coordinator, allows for the exchange of the above information. It also allows minor modifications to be made to the dive plan in the event of adverse environmental conditions or problems with any member/s of the dive team. A dive briefing should include, but not be limited to:

- The objectives of the operation and the assignments of each member of the dive team.
• The intended working depth of the operation, and the topography of the site.
• Conditions to be expected in the operating area.
• A review of communications.
• Any special equipment or considerations.
• Anticipated hazards
• “Lost buddy” procedures;
• Conditions controlling the termination of the dive (time, remaining air supply, etc.).
• Emergency response plan.
• Soliciting questions to ensure understanding of tasks and assignments.
• Questions about medications, medical conditions and general feeling of wellbeing.

A more comprehensive sample of a Dive Coordinator’s pre-dive briefing is available on the WHS website.

4.3.3 Pre-Dive Equipment Checklist

A pre-dive check must be performed on the equipment of the diver/s for all dives, including snorkelling. This should be done by either the Surface Attendant or Dive Coordinator and may also be carried out by the diver’s buddy. The checks must be recorded on the Pre-dive equipment checklist form.

4.3.4 Recording the Dive

For every Flinders University dive, the Dive Coordinator must ensure that an entry on the Flinders University Daily Dive / Snorkel Log is completed for each diver, listing all requested details of that dive. This should be completed at the surface by the Surface attendant or Dive Coordinator and, the form must be completed immediately after the dive.

Where the dive has been approved for two person diving (i.e. with no Surface Attendant), the dive leader is responsible for completing these forms immediately.

4.3.5 Post-Dive

On completion of the whole diving operation the post-dive section of the University Daily Dive / snorkel log must be completed and given to the FDA, as soon as practicable (and in any case, no later than one month after the dive operation). These records must be maintained by the FDA.

4.4 Flow Chart to assist with Dive Planning and Conduct of Diving Operations

See sample Dive Planning Flow chart, Appendix H at the end of this manual and on the WHS website for guidance on the process for diving operations & approval.

4.5 Recompression Chamber Support of Diving

The requirements of this section have been adapted from Australian Standard AS2299.2 – Occupational Diving Operations: Scientific Diving and this document should be consulted for further information.

4.5.1 Availability of Recompression Chamber Support

Dive planning for Flinders University dives must always take into the difficulties and availability of emergency recompression chamber support.
4.5.2 Diving Without a Recompression Chamber On-site

Diving undertaken without on-site recompression chamber support should be performed with controlled ascents and routine safety stops as required by this Manual (see Section 5.0). Where multiple dives are undertaken, the short form DCIEM air decompression tables, Appendix D must be followed, and residual nitrogen times taken into account in calculating any subsequent allowable dive times.

When completing a Dive Plan, the Dive Coordinator (with advice from the UDO or FDA if required) is responsible for setting out a procedure for transporting divers to the nearest acceptable and available recompression facility, and to communicate this to all other divers on the dive team.

The Dive Coordinator must also realistically estimate the time necessary for the transportation of a diver to the recompression facility in the event of an accident (such time taken as the time from when the diver leaves the water to the commencement of his/her recompression in the chamber). This is to be recorded in the Diving Emergency Response section of the Dive Plan form.

In the event that one or more significant identifiable risk factor/s (pre-disposing factors) are present before, during or after a dive (e.g. cold water, fatigue, hard work, post dive exercise, etc.), the Dive Coordinator must ensure that allowance is made for these and that if at all possible details of such are communicated to all divers BEFORE the dive.

Such allowance shall be implemented by reducing the available time for the dive, with the amount of time reduction to be determined as follows:

a) **where the dive is deeper than 12 m** - moving one or two time or depth levels, depending on the level of the risk factor/s, up the short form DCIEM air decompression tables, Appendix D; or

b) **where the dive is to 12 m or less** - moving one or two time or depth levels, depending on the level of the risk factor/s, across Table 4.1.

As well, for all dives of greater than 9 metres in depth, or between 7 m and 9 m in depth where a dive is for longer than 180 minutes duration, divers must perform a safety stop at between 3 to 5 metres depth for at least 5 minutes, where safe to do so.

4.5.3 Alterations to Bottom Times for ‘Remote’ Diving Operations

Where divers are working in remote locations (remote = any area of diving operation greater than 30 minutes from medical assistance).

Access to a hyperbaric unit may be delayed in the event of a diving accident. For this reason, where any Flinders University diving operation is conducted in an area that is greater than six (6) hours travelling time from the nearest recompression facility, great care must be taken during planning for the diving operation to allow for all risk factors that may increase a diver’s susceptibility to DCI. During such diving operations a safety margin must be added to dives by reducing the maximum bottom time permitted by the dive tables.

The following rules must be adhered to at all times during remote diving operations:

- If the permitted Effective Bottom Time (EBT) is exceeded during any dive, the diver concerned must not re-enter the water for at least 18 hours, oxygen must be administered for up to 30 minutes and the diver’s wellbeing must be monitored over this period.

- After any dive, divers must avoid any activity likely to increase their risk of contracting DCI (e.g. exercise).
During dive planning, when determining the amount of time required to evacuate a patient from the dive site to a recompression chamber, the following points should be taken into account:

a) the time commences from when the diver is removed from the water or shows any signs of DCI, and ends when they are able to be placed inside the recompression chamber;

b) the only form of transport that can reliably be counted on to be available for patient evacuation is the means by which the dive site was initially accessed (i.e. car/boat). The assumption must not be made that air or road ambulance will be available, contactable, and able to reach the site within a reasonable time period.

Notwithstanding the above, the following table must be used to derive maximum repetitive group limits for diving each day, depending on the level of recompression chamber support available.

The times given in Table 4.1 must take precedence over the short form DCIEM air decompression tables, Appendix D.

**Table 4.1: Repetitive Group Limits for Diving Depending on Level of Recompression Chamber Support (based on DCIEM Air Decompression Tables) shown as letter designations.**

<table>
<thead>
<tr>
<th>Maximum Dive Depth (m)</th>
<th>Maximum Rep. Group Chamber &lt; 2 hours</th>
<th>Maximum Rep. Group Chamber &gt; 2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>H</td>
<td>G</td>
</tr>
<tr>
<td>9</td>
<td>H</td>
<td>G</td>
</tr>
<tr>
<td>12</td>
<td>H</td>
<td>G</td>
</tr>
<tr>
<td>15-30</td>
<td>DCIEM No deco limits</td>
<td>DCIEM no deco limits</td>
</tr>
</tbody>
</table>

### 4.6 Travelling and Flying after Diving

Due to increased risk of decompression illness incurred through exposure to altitude after diving, restrictions on road and air travel apply where University divers are subject to pressures of greater than one atmosphere whilst breathing compressed air. These rules and limitations apply to all University divers and must be followed, except in the event of an extreme emergency where no other option is available. In any such case, these rules should only be breached on the advice of medical personnel trained in hyperbaric medicine, and with the consent of all diving personnel involved.

After incurring any form of decompression illness, a diver should not be exposed to greater than 150m effective altitude for seven days.

#### 4.6.1 Flying after Diving

As it is impossible to guarantee that a diver will not be affected by decompression illness due to the effects of flying after diving, the rule below must be adhered to by all Flinders University divers, except in cases of extreme emergency, i.e. where a person may require helicopter evacuation from a site. (NB: In a pressurised aircraft, the altitude referred to is the ‘effective cabin altitude’. Commercial aircraft are usually pressurised to an effective cabin pressure of 2400m or less.)

After any dive covered by this manual, using compressed gases, the minimum surface interval before the diver/s involved can travel by air shall be 48 hours.
4.6.2 Road Travel after Diving

The restrictions on road travel after diving take the form of a ‘delay period’ before divers are able to ascend to heights (over hills and mountains) of greater than a certain threshold (refer to Table 4.2 below).

The Dive Coordinator for any field trip is responsible for determining whether or not travel after the dive will exceed an altitude threshold, and to ensure the correct delay before travelling after diving is observed.

Table 4.2 is taken from Appendix H of Australian Standards AS2299.2. It lists the appropriate delay periods required after diving before travel above certain altitudes is permitted. These recommendations have been developed with advice from hyperbaric medicine specialists, and should be applied where air or road travel after a dive will exceed any of the altitude thresholds listed.

When calculating applicable delays after diving, the Dive Coordinator must also take into account the following:

   a) these recommendations are for divers who are in normal health following diving. If any signs or symptoms of illness or injury are present, advice should be sought regarding the need for emergency evacuation.

   b) exertion by their divers after any dive/s subject to this table; and

   c) effects on their divers of in-water exertion and water temperature during the dive/s.

Table 4.2 (Table H from AS2299.2): Recommended Delay before Exposure to Altitude after Diving

<table>
<thead>
<tr>
<th>Altitude (m)</th>
<th>Minimum delay before travel to altitude (hrs.)</th>
<th>Category of Dive (see Legend below)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Category 1</td>
<td>Category 2</td>
</tr>
<tr>
<td>0 - 150</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>150 - 600</td>
<td>Nil</td>
<td>2</td>
</tr>
<tr>
<td>Cabin P 600 - 2400</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>&gt;2400</td>
<td>24</td>
<td>48</td>
</tr>
</tbody>
</table>

LEGEND

Category 1: A single dive to ≤ 50% of the DCIEM no-decompression limit, or two short dives within 18h with a total, combined bottom time of ≤ 50% of the no-decompression limit for the depth of the deeper dive. No decompression dives or repetitive dives to have been performed in the preceding few days.

Category 2: Dives exceeding category 1 but not included in Category 3, e.g. one or more dives to > 50% of the no-decompression limits, or a single decompression dive in a day.

Category 3: Repetitive deep diving over multiple days; multiple decompression dives on one day; extreme exposures; omitted decompression, or other adverse events.

Note: The altitude referred to in the table is the effective altitude. In pressurised aircraft, the relevant environment is the effective altitude of the aircraft cabin and not the flying altitude. Commercial aircraft are usually pressurised to achieve an effective cabin altitude of 2400m or less.
4.7 Diving with other groups

Due to the nature of University research, situations often arise where Flinders University divers need to work with divers from other groups/organizations. The following sections outline the requirements to be met by Flinders University divers when operating under these circumstances.

4.7.1 Research Diving In Conjunction with other Organisations

Where Flinders University divers operate with divers from another organization, the following scenarios may occur.

a) Where Flinders University personnel are working with another organisation (i.e. with their divers, and/or using their vessel), the Flinders University diver/s will normally be bound by that organization’s diving code, provided that Code and Dive Plan and other documentation i.e. Risk Assessments have been provided to, and approval given by, FDA and the UDO prior to the planned operation. In this situation Flinders University divers must meet all certification requirements of the organisation, and gain approval to dive as required by the organisation’s diving procedures.

The Flinders UDO must be notified of all such diving operations, but the diver/s involved need not complete Flinders University dive record forms for these dives, provided that the organisation’s dive documentation and authentication are used and sent to FDA and UDO. Where a section or details of the field trip, risk assessment or dive planning documentation are not supplied by the other organisation then the dive coordinator or senior diver must develop these using Flinders forms.

Note that field trip and risk assessment documentation will need to be completed as per procedures.

b) Where there is going to be a significant change to Flinders University Diving Procedures or requirements (e.g. using surface supply or mixed gases or diving without shark shield) there must be documented discussion between the FDA, UDO and the organisation’s diving officer to formalise approval for Flinders University divers to participate. The organisation with the more stringent or higher standard should be followed.

c) Where Flinders University project organisers are working with divers from another organization using a Flinders University vessel, or are on any Flinders University diving operations, the divers from the other organization must meet all certification and documentation requirements of Flinders University. This includes gaining approval to dive from the FDA, UDO, and School Dean prior to commencement of the operation. The dive plan and operations (field trip and risk assessment forms) must meet the Flinders University approval processes.

As noted, all new divers, including visiting scholars must register and a lead-time of at least 10 work days is required for new diver registration.

4.8 Diving Overseas

All University divers diving overseas must discuss the risk management procedures with the FDA and UDO well in advance of the proposed diving dates. Clear lines of authority and shared responsibilities must be documented. All paper work required needs to be submitted to the FDA and then to the UDO as early as possible to ensure that all approvals through the normal School processes are obtained before the trip commences.

If it is a Flinders University managed operation, the requirements of the Flinders University Diving Safety Policy, this Manual and the Flinders University Field Trip Procedures apply. Where a section or details of the field trip, risk assessment or dive planning documentation are not supplied by the other organisation then the dive coordinator (or most senior diver) must develop these using Flinders forms.
See - Diving Overseas Guidelines on the WHS web site for factors that need to be considered when planning and undertaking any diving operations overseas. Flinders University ‘overseas travel policy’ is currently under review and new procedures will be implemented.

4.9 Insurance

Staff who undertake diving as part of their employment at the University are entitled to apply for workers compensation if they sustain an injury at the time of working. The claim, if accepted will cover them for medical expenses and any loss of income as appropriate under the University’s Return to Work policy.

The University’s insurance arrangements provide a “safety net” cover for enrolled students who incur accidental injury while engaged in University activities including work experience placements and University associated sporting clubs activities. This includes diving activities which are part of a student’s study.

Diving outside of Australian waters

Once outside of Australian waters all divers (staff and students) must purchase dive specific insurance in order to have protection. There is a range of products on the market including insurance cover provided by Divers Alert Network (DAN) Asia Pacific. In addition, staff and students travelling outside of Australia for diving related to their employment (in the case of staff) or studies (in the case of students) must have separate travel insurance. You can register for international travel insurance through the University’s website.

If you have any queries regarding insurance and dive activities please contact the University’s Insurance Officer in the first instance.

4.10 Underwater Communications

Where University divers are required to use a communications system, or wish to do so, they must consult their FDA and the UDO prior to any dive with that system, and the guidelines below should be adopted. The Dive Coordinator must run a training and familiarisation session for all personnel involved in the dive.

4.10.1 Lifelines (Diver to Surface)

In situations where University divers are required to operate with lifelines tethering them to the boat, attended by a Diver’s Attendant, all divers must be familiar with the standard communication signals listed at the end of this manual.

Consider - strong current, soft and silty bottom substrate, and risk of entrapment when using lifelines.

4.10.2 Voice Communications

Where divers are intending to use voice communication systems, they must be familiar with the particular equipment to be used, prior to attempting any dive. It should be noted that familiarisation with equipment is especially important where full facemasks are being used.

In such a case, consideration should be given to performing a familiarisation dive or dives with the equipment to be used, in sheltered waters, prior to undertaking field operations.

4.10.3 Buddy Line

A buddy line is a line joining 2 divers with sufficient strength that gives the divers the ability to communicate and stay together. It should be approx. 2 - 3 m in length.

Poor visibility would be a factor where the dive coordinator would need to consider using a buddy line.
If a Buddy Line is to be used in a dive, the UDO or FDA should be contacted for advice prior to use.

4.10.4 Float line with a dive flag

Where surface weather and distance conditions make tracking difficult, one member of each dive team should wear a dive float.

4.10.5 Emergency Recall

An Emergency Recall Plan should be developed for each dive and agreed on prior to commencement and reiterated during pre-dive briefing.
Section 5 DECOMPRESSION TABLES AND DIVE COMPUTERS

5.1 Decompression Tables

The use of a conservative decompression table is essential for safe diving. Remember that dive computers and dive tables are simply guides that attempt to take into account the physiological processes involved with the breathing of compressed gases at depths. They are most definitely not infallible, and do not take into account many factors that can affect an individual's susceptibility to decompression sickness. These factors include (but not limited to) variations in age, sex, weight, physical condition, recent illnesses/injuries.

During the formulation of the dive plan the Dive Coordinator must give consideration to any existing or potential risk factors that may render the dive less safe.

The DCIEM (Canadian Defence and Civil Institute for Environmental Medicine) Short Standard Air Decompression Tables, Appendix D must be used for all Flinders University diving operations. A familiarisation session in the use of the tables must be conducted by the UDO or FDA for all new University divers. If at any time divers have questions about any dive tables, they should consult the UDO or FDA for advice.

See DCIEM, Appendix D Tables at the end of this manual.

5.1.1 Safety Stops

In line with the dive plan, all divers are to perform a safety stop, if safe to do so at 3 metres for 5 minutes. Where a dive is longer than 120 minutes duration divers must perform a safety stop at between 3 to 5 metres depth for at least 5 minutes.

5.1.2 Ascent Rates

It is recommended that wherever possible all divers adopt an ascent rate of slower than 10 metres per minute when surfacing. Divers must not exceed the ascent rate specified in the DCIEM tables 18m ± 3 metres per minute.

5.1.3 Omitted Decompression Schedule

Where a diver has not completed any, or a full set of, mandatory decompression stops they are deemed to have Omitted Decompression.

In this instance where a chamber is not immediately available to a diver having omitted decompression, the preferred action is to get the diver to a compression chamber for treatment. The diver should receive 100% O₂ by double-seal oro-nasal mask en-route to the compression chamber.

It is crucial to seek immediate medical advice and initiate possible evacuation procedures.

After conducting the omitted decompression schedule the diver’s condition must be monitored for at least 24 hours after the dive for symptoms of DCI, and the diver must not enter the water again until at least 24 hours after the dive. As well, the diver must not expose him/herself to anything likely to increase the risk of DCI (e.g. exercise, altitude, alcohol etc.), or which could mask the symptoms of DCI (e.g. alcohol, drugs). If symptoms of DCI occur, the diver should be transported to the nearest recompression facility as soon as possible.

5.2 Dive Computers

Important Note: At this time, an approved dive table must be used for planning and control of all Flinders University dives. A computer may only be used to keep track of, or assist with any dive.
Divers using computers must be familiar with their use, including any peculiarities specific to the type being used.

- Where a diver is using a dive computer as well as dive tables, **the advice of the more conservative of the two must always be followed.** Although this is usually the dive tables (especially with short form DCIEM air decompression tables), Appendix D, many brands of dive computer take into account factors such as multiple ascents, multiple diving days and errors in planned dive profiles, and because of this, on some occasions, a dive computer may indicate a diver’s bottom time has expired earlier than the dive tables indicate that the dive should be ended.

- If a computer fails during a dive after indicating the need for decompression (decompression dives are not permitted), then ascend and follow the mandated decompression schedule. Report to the Dive Coordinator to complete the Omitted Decompression schedule.

The Dive Coordinator for any dive must ensure dive tables are used more conservatively than normal if a diver is subject to any factor/s likely to increase DCI risk before, during or immediately after a dive.
Section 6  DIVE TEAMS

6.1 Normal dive teams

A normal dive team comprises a group of people, who as a unit can perform the duties of a Dive Coordinator, Diver/s (Dive Leader and buddy/s), Diver’s Attendant/Assistants and Boat Handler (where required). A normal dive team may be made up of:

- two qualified divers diving within sight of each other at all times and at least one competent Surface Attendant; or
- three qualified divers diving within sight of each other at all times and at least one competent Surface Attendant; or
- more than three divers, grouped into pairs or trios (and diving within sight of each other at all times), and one or more competent Surface Attendants, as required.

Note: Where more than one Dive Team is in the water and there is only one Surface Attendant, dive teams must work in close proximity to each other (within 20m), or tow a surface marker buoy to allow their location to be easily determined.

6.2 Exceptions to normal dive teams

6.2.1 Two Person Dive Teams

The use of two person dive teams is discouraged, but may be approved by the FDA, UDO and Dean of School in some circumstances, such as in the case of one of the following:

a) two experienced divers working at shallow depths in sheltered waters and in a well-known previously dived location & low risk conditions; or

b) one diver working tethered or free, with fully kitted up (dressed in) Surface Attendant within close proximity.

Before approval is given for any two person diving operation, the FDA and the UDO will carefully consider the dive plan and risk assessment prepared for the dive operation.

6.2.2 Diving without a Surface Attendant

Diving without a Surface Attendant will only be approved by the FDA and the UDO in exceptionally safe circumstances, such as in cases of experienced divers working at shallow depths in sheltered waters. Diving without a Surface Attendant will not be permitted where there will be more than one buddy group in the water at one time (i.e. more than three divers).

Before approval is given for diving to occur without a Surface Attendant, the FDA and the UDO will consider all relevant factors (including those listed in Section 11).

Conditions which must be met before diving without a Surface Attendant are as follows:

- the operation must have been approved for two person diving (see Section 6.2.1) if only two divers are involved;
- the divers involved must agree they are prepared to dive without a Surface Attendant;
- both divers must sign the statement on the dive plan.
• at the time of the dive, the Dive Coordinator must have determined that "low-risk conditions" are prevailing at the dive site (these conditions are defined in Section 11 & in the Daily On-Site Diving Risk Table and the Diving Risk Assessment information.

• where the above points have been met, all divers involved must agree to abort the dive at a signal from the Boat Handler or any diver if conditions cease to be safe;

• any boat used must be moored as close to the dive site as possible, and all divers must stay within 50m of the vessel;

• a check must be made that the anchor of the boat being used is secure, immediately upon starting the dive; and

• the Dive Coordinator must ensure a current line is deployed from the stern of the boat - before divers enter the water. This should comprise a floating rope with minimum length of 10m and diameter of 10 mm, with a large, highly visible buoy preferably with a dive flag mounted, attached to its free end.

6.2.3 Solo Diving

Solo diving (i.e. diving with no buddy diver nor Surface Attendant present) is not permitted under any circumstances, except in case of extreme emergency.

6.3 Lost buddy procedures

Where divers are paired together on a dive, and lose contact with each other during that dive, the ‘lost buddy’ procedure is to be followed. This involves trying to locate each other through the following set routine:

• Immediately on noticing contact has been lost with their buddy, each diver should circle 360°, looking for the buddy, or their exhaust bubble trail (often easier to see if looking up slightly).

• If visual contact is not made after the above procedure, each diver should ascend 3 - 5 metres, and repeat the procedure.

• Return to the last known contact point if it is close and safe to do so.

• If contact is still not re-established, each diver should surface at the specified ascent rate. On regaining contact at the surface the dive may be recommenced or terminated, at the discretion of the Dive Coordinator or Dive Leader.

• If a diver is still missing more than 5 minutes after his/her buddy surfaces an immediate search should be instigated where it is safe to do so, and continued until either the diver is located or the searching diver deems that further assistance is required.

NB: The Lost Buddy Procedures MUST be discussed in every pre-dive briefing. An example of Lost Buddy Procedures is available on the WHS web site.
Section 7  DIVING AND BOATING EQUIPMENT

All equipment used for Flinders University diving/boating must meet the required Standards. Flinders University diving/boating equipment must not be used for any dives that are not approved for University activities.

The Dive Coordinator and all divers are responsible for ensuring that all required equipment is carried by each diver on every dive, unless special dispensation has been granted by the UDO and Dean of School.

7.1 Compulsory Equipment for all Divers (snorkel, SCUBA)

The following equipment must be used or carried by each diver on every dive;

- Exposure protection e.g. wetsuit or dry suit or steamer as appropriate to the prevailing environmental conditions.
- Mask, fins, snorkel and diver’s knife. The knife and snorkel shall be worn in such a way that is suitable to the equipment used and will not foul equipment or released weights. If the risk assessment indicates that the snorkel is creating an additional risk then it need not be worn.
- A weight belt or a buoyancy control device incorporating an integrated weight system with quick-release and weights (if required for buoyancy control).
- Where divers are operating in free-swimming SCUBA mode in circumstances in which there is surface support, there must be a means of emergency recall of all divers to the surface.
- A personal shark shield or equivalent deterrent device for all marine and estuary dives
- One or more shark shields dedicated to the boat when diving anywhere in Australia and where dangerous sharks are known to exist while diving internationally.

The Dive Coordinator must ensure that at/or close to their dive site there is adequate means of immediate communication and:

- Provision of medical grade oxygen should it be needed in the event of an accident or emergency.

7.2 Compulsory Equipment for Individual SCUBA Divers

As well as the equipment listed at Section 7.1, the following equipment must be used or carried by each diver on every SCUBA dive unless special dispensation has been granted:

- a SCUBA cylinder and valve designed in accordance with AS 2030 or nearest equivalent;
- a SCUBA regulator and alternative air source or air supply, such as an octopus regulator;
- a buoyancy control device (BCD) with oral and SCUBA-feed inflators, for use with both wetsuits and dry suits;
- an air cylinder pressure contents gauge;
- depth gauge
- timing device, e.g. watch or dive computer;
- a high visibility inflatable position signalling device (e.g. ‘safety sausage™’).

7.3 Other Plant & Equipment which may be required

There must be a risk assessment and SWP for all tasks undertaken and tools used. The risk assessment must identify any other equipment that may be needed i.e.
• emergency air supplies;
• further exposure protection, such as gloves, hood and booties;
• any other relevant PPE / PPC that may be identified in the risk assessment
• a compressed air powered signalling device;
• submersible dive tables;
• a lifeline or float-line or mermaid catcher or shot line;
• night diving equipment as appropriate, including primary and backup torch, and cyalume stick/s.

7.4 Task Specific Equipment which may be used by Divers

Flinders University divers are only permitted to use tools underwater if they have first received training in appropriate techniques and skills, are familiar with the operation that item of equipment, and have received permission from the UDO and FDA.

The following equipment may be used by Flinders University divers provided diver safety is not compromised:

• underwater photographic equipment;
• underwater slates, measuring tapes, lightweight grids, frames, collection bags and traps;
• sledge hammer or hammer, to pound in stakes and pickets;
• water dredge/ pump or vacuum for scientific investigations and silt removal (non-commercial) engine power not to exceed 5.5 hp per dredge line and which must be diver controlled for easy shut-off under water;
• small hand tools such as screw drivers, pliers, etc., and small hand held pneumatic tools with water or air shut-off underwater for quick diver use;
• small lift bags of no greater than 20 litres volume;
• small air lifts of no greater than 250 litres per minute air flow rate or engine power not to exceed 5.5 hp whichever is the smaller, with diver controlled easy air shut-off underwater;
• Flinders University Divers must be suitably trained and experienced with the piece of equipment that they intend to use.

7.5 Breathing Air Compressor Systems

Follow the SWP/ SWMS for the particular compressor being used.

Professional air quality testing needs to be done at least annually and within 6 months of use. Test certificate to be kept on file.

7.6 Flinders University ‘loan equipment’

Flinders University Dive equipment must not be used for dives that are not University activities. Where Flinders University equipment is issued on loan to a diver, an equipment loan form detailing the condition of the equipment must be signed by both parties (FDA and diver) at handover, and on return of the equipment.

After issue, the diver is fully responsible for the care of any such equipment, and must ensure proper cleaning and maintenance is carried out regularly. Problems with any item must be reported to the FDA as soon as possible and the equipment tagged appropriately and not used until rectified. It must not be further loaned out to others.
If any University equipment is abused, damaged, or stolen, due to inadequate care, the diver concerned will be required to replace/repair the item/s involved immediately, at their own expense.

7.7 SCUBA Cylinders

Flinders University SCUBA cylinders must not be used for dives that are not University activities.

7.7.1 Testing of SCUBA Cylinders

All Flinders University SCUBA cylinders must be tested and serviced at least annually (and this must be recorded with FDA), and any cylinder used on a University dive must be in test date at the time of the dive. If any cylinder is found to be totally drained of air at the time of filling, it must be inspected and tested prior to being used again.

7.7.2 Filling of SCUBA Cylinders

Flinders University SCUBA cylinders may only be filled at approved filling stations, or with a portable air compressor unit approved for such use by the UDO. After filling, cylinders should have their valves taped or capped to prevent contamination and allow easy identification of full cylinders.

The amount of air pressure left in returned cylinders must be checked prior to filling, and cylinders must have at least 50 BAR of pressure remaining. If, at the time of filling, any cylinder is found to be totally drained of air, it must be inspected and tested prior to being used again, the cost of which will be charged to the last user of the cylinder.

Cylinders with any defects (e.g. air leaks from valves) must be tagged OUT OF SERVICE and put aside for defects maintenance, with the details recorded in the diving equipment defects log (which shall be kept by the FDA). Users who have not previously used cylinder filling compressors must not do so until they have been given detailed operational and safety instructions by a competent and trained person e.g. FDA. SCUBA cylinders which do not belong to the University may be filled with the University’s compressors at the discretion of a competent person and if the cylinder has passed a hydrostatic inspection during the previous year.

Details that should be recorded at the time of the fill:

- that the diver who will be using it is a certified SCUBA diver;
- a record is kept of the fill/s provided, on the Flinders University filling record sheet kept by the compressor, including the date, as well as the name of the person the fill was for.

7.8 Use of University Equipment by Non-Flinders University Personnel

Flinders University equipment may only be used by personnel from outside the University on approved University activities & use must fulfil the requirements of this manual.

7.8.1 University Research Vessels

Organizations/groups who charter Flinders University vessels may dive following their own diving procedures, provided those procedures meet all relevant government standards for the type of diving operation.

7.9 Use of Personal Diving Equipment

Personal diving equipment may be used by divers/personnel from the University where the following conditions are met:

- equipment must be approved for use by the FDA/UDO;
• equipment must be maintained in service at the owner’s expense, as per Section 7.12, unless otherwise agreed; and

• evidence of servicing of equipment/or a copy of current service certificates must be forwarded to the FDA prior to use, and kept on file for a minimum of seven years.

7.10 Pre-Dive Equipment Check

For all Flinders University dives a full pre-dive check must be performed on the equipment of any diver/s. This should be done by either the Surface Attendant, or by the diver’s buddy.

A suitable Pre-dive Equipment Checklist can be found on the WHS website. Completed checklists are to be kept as part of records by the FDA.

7.11 Medical Equipment

7.11.1 First Aid Kit

For every Flinders University diving operation, a first aid kit that meets minimum requirements of a remote kit (as set out in the Approved Code of Practice for First Aid in the Workplace) AND a “Scale F kit” as required under the National Standard for Commercial Vessels must be available on site.

7.11.2 Oxygen Resuscitation Equipment

(e.g. Oxycare resuscitation kit, O₂ DAN kit or similar)

For every Flinders University diving operation (including snorkelling), oxygen resuscitation equipment suitable for the treatment of an unconscious, breathing patient, and a supply of medical oxygen sufficient to transport at least two patients to the nearest treatment facility must be available on site.

All such oxygen resuscitation equipment must be kept clean and dry in a waterproof case, and maintained as per the schedule set out for diving equipment in Table 7.12 Maintenance Schedule.

Note: other emergency / rescue equipment may be recommended for specific diving work or situations e.g. rescue harness. This will however be up to individual schools/areas to implement, based on full Risk Assessment and controls.

7.12 Equipment Maintenance

All diving and safety equipment used on Flinders University diving operations (including personal equipment) must be maintained and serviced at least to the manufacturer’s specifications. As a minimum, the following service schedules must be observed for the equipment listed below.
Table 7.12 Maintenance Schedule

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Maintenance Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCUBA cylinder</td>
<td>12 months service/test required at qualified test station</td>
</tr>
<tr>
<td>Air storage cylinder</td>
<td>service/test required every 5 years at qualified test station</td>
</tr>
<tr>
<td>Regulator/Contents gauge</td>
<td>annual service required by a qualified technician</td>
</tr>
<tr>
<td>Depth gauge (mechanical)</td>
<td>must be checked if there are concerns about accuracy</td>
</tr>
<tr>
<td>Depth gauge (electronic)</td>
<td>must be checked if there are concerns about accuracy</td>
</tr>
<tr>
<td>Dive computer</td>
<td>depth sensor must be checked if there are concerns about accuracy</td>
</tr>
<tr>
<td>BCD inflator unit/valves</td>
<td>annual check required</td>
</tr>
<tr>
<td>Air compressor systems</td>
<td>air purity - every 12 months, or 100 hours whichever comes first – as per manufacturer’s instructions</td>
</tr>
<tr>
<td>Oxygen equipment</td>
<td>annual service required by a qualified technician</td>
</tr>
</tbody>
</table>

All equipment in use must be cleaned and/or flushed with fresh water at the end of every working day, and any faults or defects noted. **Defective equipment must be tagged OUT OF SERVICE** to prevent accidental use and all defects must be reported to the Dive Coordinator and then the FDA. Equipment that is known to be faulty in any way must not be used.

A supply of OUT OF SERVICE TAGS must be kept in a location accessible to all Flinders University divers, e.g. O₂ DAN kit.

Maintenance records for all University diving equipment must be filed by the FDA.

7.13 Equipment Hygiene

To help prevent possible transmission of infectious diseases between divers, sharing of face masks, snorkels and regulators between divers is discouraged, unless an appropriate disinfection schedule has been completed. Flinders University divers issued with equipment are responsible for the hygiene of the equipment whilst it is in their care.

7.14 Dive Flags

The international dive flag (code alpha - blue with white swallow tail) or local equivalent (especially for overseas dives) must be flown from any boat used as a platform for a Flinders University diving operation. As well, a dive flag must be used in the following situations:

a) when diving in water of less than 3 m depth, a large dive flag must be positioned immediately above the dive site, either in a boat, or through use of a float supported flag - particularly in areas where there is a high level of danger from boat traffic (such as near boat ramps);

b) when diving from shore, **either** a large dive flag must be placed on the shore to indicate the position of the dive site, and one diver from each buddy group involved on the dive should tow a smaller dive flag on a surface float to indicate the position of that buddy group at all times, **or** a large floating flag must be towed by the divers;

c) where a diving operation involves two or more buddy groups, and those groups are not intending to dive together, one diver from each buddy group involved on the dive must tow a smaller dive flag on a surface float to display the position of that buddy group to the Surface Attendant at all times.
Section 8  SNORKEL DIVING

As a general guide, snorkel diving by Flinders University personnel should only be used as an observation, photography, search or collection technique. No difficult or strenuous work of any kind should be attempted using snorkel diving, without implementation of appropriate safety precautions and approval by the UDO and Dean of School.

An individual wishing to participate in snorkelling activities through the University must be listed on the Faculty Diver Register, must meet all snorkel requirements of this manual (see Section 2.2), and must satisfy the UDO or FDA of their fitness to take part in the activities planned.

Snorkelers and coordinators must complete the Flinders University Dive Plan, all risk assessment documentation and field trip plans prior to commencing the diving activity.

8.1 Other Snorkel Diving Considerations

All persons participating in snorkel diving must be competent swimmers and observe the rules regarding boating, diving and swimming safety. Inexperienced snorkelers must undertake snorkel diving familiarisation at the direction of the UDO, FDA or Dive Coordinator and should initially practice in either a swimming pool, or other sheltered, shallow waters.

The UDO or FDA has the right to assess any snorkel diver new to the Dive Register. A formal assessment test would comprise the elements covered in the swimming and finning sections of the New Diver Evaluation form as well as a method of assessing any ‘snorkelling specific’ skills, as determined by the UDO or FDA.

8.2 Size of Snorkel Teams

The minimum size of a snorkel team is three, comprising 2 snorkelers and a surface support.

The Dive Coordinator must be aware of, and make allowance for, the fact that the level of fitness required for safe breath hold diving is higher than that for SCUBA or SSBA diving.

8.3 Supervision of Large Groups

Where snorkelling is conducted by large groups (i.e. > 6 people) there must be at least one person on watch at the surface for every six divers. The Surface Coordinator/s must perform a regular head count, and must be capable of going to the assistance of any person in difficulties. Coordinator/s must be equipped with a whistle (or other suitable equipment), and the group must be informed that if the whistle is sounded, all snorkelers must return to the beach/boat. All snorkelers must be paired up (experienced with novice where possible) and told to remain in contact with one another during the dive.

8.4 Briefing for Snorkel Diving

Before commencement of any snorkel diving operation, the Dive Coordinator must give a briefing, to ensure that all those involved are familiar with important information such as dive objectives, area of operation, environmental conditions, problems that may be encountered, etc. A sample Dive Coordinator’s Pre-dive briefing is available on the on the web site and may be adapted for this purpose, but it must include details of any agreed recall signals (e.g. whistle).

8.5 Other Safety Considerations

A dive flag must be displayed adjacent to any snorkelling site at all times. It is highly recommended that selected snorkel divers wear a safety line with surface float/diver flag, to clearly display their
location to the Dive Coordinator, and to aid in the diver’s recovery from the water in the event of an accident.

8.6 Depth Limit

Given the very real dangers of shallow water blackout (hyperventilation) divers participating in snorkel diving should take great care to not exceed their personal limits. No diver will exceed 5 m depth at any time.

No snorkel diving other than surface observation (where the diver remains at the surface at all times) is to be undertaken by any diver who has a repetitive factor (RF) of greater than 1.1 from previous compressed air diving operations.

During snorkel diving operations, appropriate first aid kit and oxygen resuscitation equipment, with sufficient medical oxygen supplies for the area of work, must be on site. At least one person involved must have qualifications in their use.

Snorkelling is prohibited in areas of high boating traffic, e.g. around boat ramps or in shipping channels.

Section 9 NITROX DIVING

The following guidelines address the use of nitrox (see glossary for definition) by Flinders University divers.

9.1 Prerequisites

In the first instance written permission from the UDO and the Dean of School must be obtained before nitrox can be used on any Flinders University dive.

Any diver wishing to use nitrox for a Flinders University dive must hold an advanced nitrox diver qualification from a recognized diver training organization. Proof of qualifications and experience must be given to the FDA and the UDO before a diver will be permitted to use nitrox on a Flinders University dive. (Refer to Guidelines on Nitrox Diving on the WHS web site).

Section 10 CLOSED AND SEMI-CLOSED CIRCUIT REBREATHERS

Closed & semi-closed circuit rebreathers are NOT approved for use for University dive activities.

Section 11 ASSESSING DIVING RISK

A written Risk Assessment using the approved Flinders University risk assessment process must be carried out for all University diving operations before they can proceed – Diving Risk Assessment Information & the Risk Assessment form are available on the WHS web site.

There is seldom a clear distinction between a ‘safe’ or ‘easy’ or ‘non-hazardous dive’ and one where it is necessary to take added precautions.

It is the initial responsibility of the Dive Coordinator for any particular diving operation, to ensure as far as is practicable that all hazards are identified for that operation through the Risk Assessment process.
At the planning stage for any Flinders University Diving Project, the Dive Coordinator for the trip must ensure that a risk assessment for all aspects of the field trip is undertaken. All the diving requirements documentation and the risk assessment form must be forwarded to the FDA and then UDO for approval. The Dive Coordinator must then submit the documents to the Dean of School for final approval prior to commencement of any diving. Where a risk assessment already exists for any project or task, the Dive Coordinator is responsible for reviewing this on a regular basis and updating when any of the project/task conditions or procedures change in any substantial way e.g. where an increased risk may exist.

Following this assessment, the FDA and the UDO are to review the documented assessment before the UDO forwards to the Dean of School for final sign off.

The UDO must be sure that any Dive Coordinator responsible for implementing the control measures is capable of doing so.

Once on site, day to day risk assessment is the responsibility of the Dive Coordinator for each operation. Special consideration must be given by the Dive coordinator and the FDA/UDO for dives involving any high risk factors (for lists of potential risk factors see Daily On-Site Diving Risk Table).

11.1 Dive Profiles

Some dive profiles are associated with higher risks of decompression sickness than others. A dive profile which attains maximum depth early in the dive and gradually ascends to shallower depths is recommended. Dives that incorporate profiles that are known to expose divers to a higher risk of decompression sickness should be avoided or additional safety margins must be included in the dive plan.

11.2 Multiple Ascents

Research has shown that the more ascents performed during a day's diving, the greater the risk of DCS. Multiple ascents during a dive increase the risk of DCS by increasing the opportunity for bubble formation during the extra ascents.

Once bubbles have formed, rates of gas up-take and elimination are altered for all subsequent dives until there has been a long enough surface interval (SI) to allow complete off-gassing. This SI cannot be accurately determined through the use of dive tables, so dives must be planned carefully to ensure the number of ascents during a dive is kept to a minimum or additional safety margins are included in the dive plan.

Divers must not perform more than seven (7) ascents or go beyond the permitted Repetitive Group allowed by Table 4.1 for their location and depths, in any 24 hour period, whichever is the lesser. All multiple ascents should be at a rate slower than 9 metres/minute.

11.3 Multi-day Repetitive Dives

Divers performing successive multi-day repetitive dives must use the short form DCIEM air decompression tables (Appendix D) for calculating their no decompression limits on each dive. The effects of nitrogen build-up during this type of diving operation may lead to increased incidence of DCS, and the risk of this must be considered even when all dives are shallow (current information indicates that shallow dives may have an elevated incidence of DCI).

- restricted student divers or other divers who cannot fully mitigate DCI pre-disposing factors, and who have been performing repetitive dives over multiple days:
  - with three or more dives per day, must have a 24 hr break from diving after the 3rd day;
  - with fewer than three dives per day, must have a 24 hr break after the 5th day.
• All divers must show on the risk assessment how their planned dive profiles and dive days will mitigate against DCI.
• For divers under other classifications: after diving for five (5) consecutive days, the sixth (6th) will be a clear, continuous 24 hour dive-free break.

Divers shall not perform more than seven (7) ascents or go beyond the permitted Repetitive Group allowed by Table 4.1 for their location and depths, in any 24 hour period, whichever is the lesser.

Without prior approval from the UDO, no diver is to spend more than six (6) hours total time in the water in any 24 hour period, whether the tables allow this or not.

The requirements in this manual for travel after diving must be followed.

11.4 Long Dive Times

Excessive dive duration is a potent predisposing factor to decompression illness, particularly when coupled with multiple ascents and multi-day diving operations. For this reason, all Flinders University dive plans should keep the amount of time divers spend in the water on any given day to a minimum and in any case to no more than six hours total time in the water in any 24 hour period (unless the UDO gives prior approval for a longer period). Dive Coordinators should plan all diving operations with this aim in mind.

11.5 Diving during Strong Wind Warnings

If strong winds are likely to be present at a site, diving should only be conducted where the site is situated in a sheltered location (e.g. on the lee side of an island or headland). At the time of departure for the site, the Dive Coordinator must re-assess conditions at the site, as well as the sea conditions that will need to be negotiated to reach the site at return. Note there may be limits / consideration that may apply to the boat.

11.6 Night Diving

For a night dive to be approved by the UDO, the following conditions must be met:

a) Special permission needs to be sought from the UDO for a night dive (include the details in the Dive Plan under special conditions section).

b) The provision of a Boat Handler/ Surface Attendant, or shore watch person (for shore dives) is mandatory.

c) The Boat Handler/ Surface Attendant must have a white light suitable for signalling passing boats.

d) Any boat used for night diving must comply with all proper navigation lights as required, especially a working anchor light.

 e) After anchoring, a flashing strobe light must be attached to the anchor line at the optimum distance below the surface that will allow divers to find the vessel without surfacing (where visibility permits this).

f) Exit lights must be set when diving from shore.

g) Each diver must have at least two (2) torches and a Cyalume stick or light, which is visible in a 360º arc.
h) Night dives to depths of greater than 18 m must have compelling justification. For these dives, special control measures may need to be implemented, at the discretion of the UDO and FDA.

11.7 Currents

Diving in currents stronger than a diver can easily swim against is strongly discouraged. If permitted, all divers involved must be experienced in this type of diving and be tethered to the boat or use a surface float, so that their location is always visible. An experienced boat handler with knowledge of local conditions must be in charge of the vessel. Where an anchored vessel is being used for untethered scuba operations in such conditions, a current line of at least 30m length and 10mm diameter must be streamed behind the vessel, and the divers must work ‘up-current’ of the vessel.

11.8 Deep Dives

Special permission must be obtained from the UDO and Dean of School before any dives are undertaken to depths of greater than 21 m.

11.9 Remote Dive Site Locations

A remote dive site location is any area of diving operation further than 30 minutes from medical assistance.

At least one member of any dive team working in a remote location must be experienced with the type of conditions expected at all sites to be dived in the area. Special consideration must be given when anchoring the dive boat on steep drop offs and in areas with breaking waves, as well as with driving the boat through narrow channels with standing waves. Divers must exercise special caution in surge zones and passages, where strong currents commonly occur.

Any vessel operating in remote areas must be equipped with extra fuel, and all required radio, safety and first aid equipment, as well as any other items deemed necessary by the UDO, FDA or the Dive Coordinator for the trip.

For long field trips to remote areas, the Dive Coordinator for the operation must consider availability of the nearest recompression chamber in the event of a diving accident (see Section 4).

11.10 Decompression Diving

Decompression diving is NOT permitted during Flinders University diving operations.

11.11 Lack of Local Knowledge

Divers with little local knowledge of a proposed dive site, or of Australian diving conditions, are not be permitted to dive unless accompanied by a Dive Coordinator familiar with the proposed dive environment.

11.12 High Risk Shallow Dives and Boat Traffic

Shallow dives in areas of heavy boat traffic expose divers to greater risk of injury from such traffic. Such dives must only be undertaken under compelling circumstances and with special permission from the UDO and Dean of School. If diving in such an area, divers must fly a dive flag on a float immediately above their work site to indicate their position.

Working close to cliffs / wave cut platforms / rock platforms (& high energy coasts) are other examples of where the risk assessment will require special considerations.
11.13 Restricted Overhead Environments (Obstructed Ascents)

Restricted overhead environments include any diving environments in which direct ascent to the surface is impeded by a physical barrier, including cave, cavern, ice, shipwreck penetration or aquaculture net.

Special permission needs to be sought from the FDA & UDO for a Restricted Overhead dive (include details in the Dive Plan under special conditions section).

It does not include underwater areas, in which:

- Two divers can easily swim abreast;
- There is no significant danger of entrapment or entanglement;
- Loss of visibility due to siltation is unlikely;
- Direct sunlight is always available for illumination.

11.13.1 Minimum Certification and Experience

a) Divers must document training in restricted overhead environment diving appropriate for the conditions in which dive operations are to be conducted. Such documentation must be to the satisfaction of the UDO. Training must be conducted by agencies and instructors approved by the UDO.

b) Divers must demonstrate to the UDO, proficiency in planning and executing dives in a restricted overhead environment appropriate to conditions in which diving operations are to be conducted.

11.13.2 Minimum Equipment Requirements

a) Divers must employ a continuous line from a point outside the overhead environment to their position;

b) A minimum of three lights must be carried by each diver except in environments in which direct sunlight is visible, where each diver must carry a minimum of two lights;

c) Redundant breathing gas delivery systems must be designed so that no single component failure can prevent access by the diver to an appropriate breathing gas supply;

d) An alternate second stage must be included with a hose of adequate length to facilitate emergency gas sharing while swimming in a single file formation;

e) The UDO may require redundancy in other equipment systems to ensure dive team safety, including:
   - Submersible Cylinder Pressure Gauges;
   - Dive Computers or Decompression Calculation Devices;
   - Dive Timing Devices;
   - Depth gauges;
   - Buoyancy Control Devices

11.13.3 Minimum Operational Requirements

a) Divers must immediately begin exiting from a restricted overhead environment when a light source or any other piece of equipment fails or malfunctions;

b) Divers must begin exiting the overhead environment as soon as any member of the dive team reaches two-thirds of his/her starting air supply;
c) Where an enclosed or confined space is not large enough for two divers, a diver must be stationed at the underwater point of entry, an orientation line must be used and an emergency breathing gas supply must be available at the point of entry;

d) Emergency procedures for loss of gas supply, equipment malfunction, team separation, unexpected diving conditions and loss of visibility must be developed. All emergency procedures must be reviewed by the divers prior to each dive.

11.14 Blue-Water Diving

Bluewater diving is diving conducted in any body of water in which there is no physical bottom within diving depth ranges. The following procedures are derived from the publication, *Scientific Bluewater Diving* (listed in bibliography). Exceptions to these procedures may be made on a case-by-case basis. If a risk of entanglement with other structures exists, there must be other means of physical control.

Special permission needs to be sought from the UDO for a Blue Water dive (include details in the Dive Plan under special conditions section).

Procedures for diver control and communication must be developed to the satisfaction of the UDO.

11.14.1 Minimum Certification and Experience

The diver must have completed practical training in blue-water diving techniques, and demonstrate proficiency to the satisfaction of the UDO. This training must include:

- Bluewater diving equipment deployment;
- Entry procedures;
- Buoyancy control and awareness;
- Diver communication;
- Scientific procedure familiarisation;
- Out-of-air procedures;
- Dangerous marine life defensive techniques;
- Exit procedures;
- Emergency communication and protocols.

11.14.2 Equipment Requirements

a) Divers must employ a down-line and counter weighted trapeze line system to maintain diver contact and depth control;

b) The total weight in water of the down-line and tether array must be no greater than 5 kg;

c) All diver tether attachments must use connectors that can be quickly released by the diver while the line is under a tension at least equivalent to the weight of the entire array. Attachments must be to either the diver’s BCD, or to a separate harness, but not to the diver’s weight belt.

11.14.3 Operational Requirements

A lookout/boat operator must be stationed aboard any small craft from which blue-water diving is conducted as long as divers are in the water.

11.15 Medical Assistance

The Dive Coordinator for any dive or set of dives is responsible for determining the most efficient means of obtaining medical assistance in the event of an accident during the dive. This information must be recorded in the Field Trip documentation.
Use these links for information on some Health and Medical Facilities and Diving Doctors.

Note - An appropriate first aid kit must always be carried during diving operations.

Adequate supplies of medical oxygen must be carried in the boat and/or vehicle to keep at least two (2) individuals on oxygen until such time as the patient can be ‘handed over’ to qualified assistance, or until further supplies of oxygen can be accessed.

For all Flinders University dives, approved resuscitation equipment must be carried in the boat and a person trained in the use of such equipment should be present as the Surface Attendant.

11.16 Time since last Dive

The UDO or FDA may require that a diver undergo an initial supervised dive or pool session if he/she has not dived during the previous six (6) months. This session would cover the requirements set out in the New Diver Evaluation form (refer to the WHS website). The UDO may conduct this supervised dive himself/herself or may delegate to an equivalent person if they are a qualified Dive Master, Scientific Diver equivalent or higher qualified.

11.17 Dangerous Marine Animals

Divers intending to work with dangerous marine animals must indicate what these are likely to be on the Dive Plan and ensure that risks are adequately identified and appropriate controls identified in the risk assessment. The Dive Plan must contain adequate information to inform the UDO and any persons in their dive team of the most appropriate first aid procedures for injuries associated with such animals. This is especially important for marine injuries requiring specialised treatment.

11.17.1 Sharks

The presence of sharks in Australian and other countries' waters is a recognised high risk problem for diving operations. Therefore recognised shark deterrents i.e. Electronic Shark Shields or equivalent are a compulsory part of all divers' equipment while carrying out marine or estuary diving operations. This would only not apply under exceptional /special circumstances and the reasons must be fully documented in the risk assessment & dive plan or on-daily dive log & checked by phone to the UDO.

Shark shields are compulsory for all University diving vessels used for marine or estuary diving operations. See Shark Shield Guidance note & Safe Operating Procedure (on WHS web site) and the manufacturer instructions for details.

Seal colonies & aquaculture facilities are a particular problem as they often attract sharks. Any dive conducted within 1 km of these at any time of year must have special permission from the UDO and Dean of School.

No free swimming dives are permitted within 5 km radius of a seal breeding colony at any time during pupping season (usually in November to March inclusive). Divers wishing to work regularly near seal colonies should consider the use of specially fabricated cages, or some other mechanism to facilitate this type of work.

No free swimming dives are permitted within a 1 km radius around an aquaculture facility during harvest time.

During any dives in areas where sharks have been sighted in the past (and particularly within 5 km of any seal colony), divers MUST avoid snorkel diving and extended surface/mid-water exposures.

Where a higher than normal risk of diver / shark interaction has been identified by any project risk assessment, all divers involved in the project must be made aware of and agree to follow the procedures outlined below:
• The decision to dive or not to dive lies with each individual diver and under no circumstances will any diver be pressured into diving under circumstances that they consider to be unsafe. A decision to dive is to be made only after a thorough risk assessment has been made of the site and the conditions.

• Individual divers and Dive Coordinators are responsible for assessing the risks of shark interaction before undertaking any dive operation.

• Except when using a specifically designed/commercial shark cage, no diving operations will be undertaken for at least two (2) nights within 5 km of a location where a white pointer/bull/tiger shark has been reported. (Note that this is the mandatory minimum restriction to diving operations and that other restrictions may be adopted in individual cases).

• Dive Coordinators must attempt to obtain up to date information on recent shark sightings from all reliable sources immediately prior to each dive trip (e.g. the afternoon before a morning departure).

• The use of individual electronic shark shields is compulsory for all marine and estuary dive operations undertaken by Flinders University divers.

• Emergency recall systems should be established where possible for all marine or estuary diving operations.

• In areas where a higher than normal risk of shark interaction has been identified, divers must operate in pairs to provide a better opportunity of detecting sharks at a distance before they become a threat.

• An injured or bleeding diver must leave the water immediately; other divers should also exit the water.

• No one will spear, catch, stab or mutilate fish or throw burly or offal into the water near diving operations.

11.17.2 Procedures for when a shark is encountered

Action to be taken by diver(s)
If a diver encounters a shark during a diving operation the following procedure should be followed:

• Remain calm; do not rush to the surface as the shark is likely to follow;

• Attract the attention of your buddy if they are not aware of the shark;

• Both divers should face each other to keep the shark in view;

• Ensure your shark shield is on and operating;

• If using towed buoys the emergency signal should be given. This should consist of rapid up and down deployment of the buoy to attract the attention of the surface vessel. On seeing the signal, the vessel should immediately be positioned above the divers, and the coxswain must ensure the vessel’s shark shield is operating correctly (should one be fitted) and prepare for the retrieval of the divers;

• During ascent, divers should stay together, and prepare for quick entry into the vessel by undoing all harness/BCD attachments to facilitate this;

• The ascent should be made in a calm manner maintaining awareness of your breathing and ascent rate;
• Approaching the surface your BC should be removed and weight belt dropped so as a quick assisted entry into the vessel can be achieved.

**Action to be taken by support vessel personnel**

Where a higher than normal risk of diver/shark interaction has been identified for a diving operation it is imperative that a vigilant watch is kept by the Dive Coordinator at all times while divers are deployed.

If the dive vessel personnel sight a shark while divers are deployed the following actions should be taken:

• The vessel should be located directly above the divers' bubbles with vessel shark shield activated;

• The divers’ attention should be gained by one of the following methods:

  **Pulling on the divers’ towed buoy**

  **Coordinator to Diver**
  One strong pull to gain the divers' attention followed by a series of 4 bells (4 short quick pulls).

  **Diver to Coordinator**
  4 bells to advise that the recall signal has been received and acknowledged.

11.17.3 **Diving in High Risk Sites**

The following are examples of high risk sites:

• High density fishing sites, both commercial and recreational, including sea-based fish processing - to be avoided at times of fishing effort.

• Sea aquaculture sites such as tuna cages - all shark precautions must be adhered to.

• Aquaculture site assessment transit along the seabed.

• Environmental situations of poor visibility or polluted waters - to be avoided or strict precautions to be taken.

• High energy coast lines.

• High infestations of marine pests such as stingers, sea snakes, blue-ringed octopus etc...

11.18 **Task Related Factors**

For diving tasks requiring the use of winches with large cable, cranes and other heavy tools, divers must be trained to at least Australian Standard 2815.2, and must use voice communication between surface operators and divers.

Water dredge, air lift, pneumatic tools & hydraulic tools, specialized measuring equipment, specialized photography and high definition video cameras are also equipment that may pose additional risks. Appropriate tool use must be carried out by suitably trained divers, relative to each tool or equipment type. Water dredges used by Flinders’ workers must be 5.5 horse power or lower, 400 –350L/min and must have a valve on the device that can be controlled by the diver. Generally air lifts are not to be used unless for small scientific research for which a separate plan and risk assessment must be written.
11.19 Diving Without a Surface Attendant

Diving without a Surface Attendant present is not recommended, but may be performed if approval is granted from the UDO, and FDA. Such diving will not be permitted in cases where there will be more than two buddy groups in the water at one time (also see section 6.2).

When making an assessment of whether or not to allow diving to take place without a Surface Attendant, the UDO &FDA must take into account all relevant factors, including but not limited to:

a) experience of the divers involved;
b) depth of the proposed dive/s;
c) nature of the dive site;
d) weather conditions likely to be prevailing at the time; and

e) task/s to be performed.

Other conditions that must be met before diving without a Surface Attendant may take place are listed at Section 6.2.2.

11.20 Diving while the Dive Boat is under way (working live)

*Working live* is where a dive boat is kept under way and/or its propellers are rotating whilst divers are in the water. The main danger is the potential for injury to divers from the hull and propeller/s of the boat which need to be mitigated and controlled. Working live may be required due to anchoring bans or divers surfacing in high energy zones.

Except in cases of emergency, this practice is not permitted during a diving operation unless the Dive Coordinator expressly receives approval from the UDO and School Dean, and the following conditions are met:

a) The Boat Handler must be suitably qualified to drive the boat being used, and must also have considerable experience in small vessel handling (as determined by the UDO or FDA);
b) A separate Surface Attendant must always be present to overcome situations where the Boat Operator may not be able to clearly see the location of the divers at all times from the boat’s control position;
c) A dive flag must be flown at all times;
d) All divers involved in the operation must agree to the use of this practice.

11.21 Exercise

Divers should not participate in activities involving vigorous physical exertion before, during (if avoidable) or after diving, as exercise of this nature will predispose a diver to DCI.

Where exercise is unavoidable before, during or after a dive (e.g. diving in strong currents, or walking in to a dive site) the UDO should be advised and extra allowance made to take account of this factor when calculating permissible dive times.

11.22 Alcohol and Drugs

Alcohol and drugs should not be consumed within 12 hours prior to diving, and must not be consumed until after any diving for the day is over. At all times, especially when diving over multiple days, alcohol should only be consumed in moderation, if at all.
Alcohol and drugs consumption will increase a diver’s susceptibility to DCI, enhance the effects of inert gas narcosis, and increase a diver’s rate of heat loss in cold water.

11.23 Fatigue

During diving operations, fatigue can be extremely dangerous, and is also a potent predisposing factor for DCI. A tired diver should not be permitted to dive, and Dive Coordinators should monitor this.

All divers participating in a diving operation should ensure they get adequate sleep, as defined by the requirements of the diving programme.

11.24 Cold

All Flinders University personnel undertaking diving operations should take care to stay as warm as possible.

A diver should cease diving operations if they become uncomfortably cold.

To minimise the effects of cold, all divers should take care to keep warm before the dive, and must wear appropriate exposure protection during the dive. In particularly cold water, dives should be planned to minimise the amount of time in the water and the number of entries and exits made during the day. Sufficient time between dives must be allowed for a diver to rewarm adequately, prior to the next dive.

It should be noted that divers will continue to lose heat from their bodies for some time after exiting the water, and this ‘after-drop’ in body core temperature can reach dangerous limits even if the diver was in a reasonable state on exiting the water. For this reason, Surface Attendants should monitor all divers for signs of hypothermia after any dive in cold water.

In environments away from temperate waters careful consideration & pre planning for the correct thermal protection for divers must occur.

11.25 Drugs/Medication

If at all possible, it is advisable for divers to avoid taking any drugs or medications whilst diving.

Drugs can influence diving safety in other ways, such as by impairing judgement and concentration, or by affecting a diver’s susceptibility to narcosis and/or DCI.

If any Flinders University Diver is required to take medication for either short or long term prescription, they should contact their diving doctor for advice on any potential problems this may cause. They must inform the Dive Coordinator if they are programmed to dive.

In particular, divers should take care to check on potential complications with some seasickness medications, and some drugs used to assist people to stop smoking.

11.26 Definitions of ‘low risk’ Conditions

a) Depth of the site and its immediate surroundings does not exceed 15 m;

b) Swell and/or wave height does not exceed 0.5 m;

c) Current is nil to slight (a diver is able to easily swim into the current, with minimal exertion);

d) Underwater visibility is greater than 4 m;

e) Weather forecast is favourable;

f) The dive starts and ends in full daylight.

For further information on risk assessments see Daily On-Site Diving Risk Table and Diving Risk Assessment Information (see the WHS web site).
Section 12    EMERGENCY RESPONSE

12.1 Emergency Plan

- A detailed Emergency Protocol & Flow Chart Appendix C (If a Diving Emergency Develops) is available at the end of this manual & on the WHS web site.

In the event of an emergency immediately assist the injured person and seek the appropriate medical assistance where required.

All members of the Dive team should be familiar with details of the Diving Emergency Protocol.

The Dive Coordinator for the operation must prepare an emergency response plan for each diving operation and record this on the Dive Plan (in the Diving Emergency Response Plan section).

12.2 Emergency Reporting Procedures

The procedures given below are the minimum that should be carried out in the various circumstances.

12.2.1 Reporting Minor Accidents / Incidents or Near Miss

- Provide First Aid or medical assistance as required.

- Once the person(s) and the area are safe, details of the accident or incident need to be gathered.

- Report on the Flinders University accident/Incident system (FlinSafe) or on the Accident/Incident Report Form. Details need to be included in the Diver’s Log Book and the Dive Record. A short report on the incident must be lodged with the UDO and FDA as soon as possible after the event.

- A summary of events leading up to the accident/incident should be obtained from the person in charge of the workplace and should be attached to the FlinSafe system or the Accident/Incident Report Form.

- all accidents or incidents must be reported to the WHS Unit where possible within 48 hours or on return from the trip [unless the accident results in a death, a serious injury or illness or is a dangerous incident (see below)].
12.2.2 Reporting of NOTIFIABLE INCIDENT

(ie death of a person, serious injury or illness, or a dangerous incident)

- Provide First Aid and obtain medical assistance (see Emergency Protocol & flow chart, Appendix C at the end of this manual & on the WHS web site).

- Secure the scene and make sure no one else is placed at risk.

- The site can be disturbed to move a deceased person, assist an injured person, make the site safe or assist with a police investigation. Otherwise do not disturb the scene.

- Notify the UDO, or if UDO not available, University Security immediately by phone (see front cover of this Manual for contact numbers). These members of staff will notify the Associate Director, WHS. Note - some accident/incidents must be immediately notified to the relevant Regulator (see orange section below for details). This will be done by the Associate Director, WHS who will also advise other relevant senior management/staff.

- As soon as possible after the event, the accident/incident must be reported by FlinSafe system. If the diver is not able to complete this themselves then it is the responsibility of the Dive Coordinator.

- The Dive Coordinator and/or Dive Leader must provide additional information in a detailed report to the University’s WHS Unit and the UDO. The Dive Coordinator should attach all comments and recommendations to the FlinSafe system or direct to the WHS Unit (if no internet access) (see below 12.3 for investigation of accident / incidents).
WHAT IS A SERIOUS INJURY OR ILLNESS?

A serious injury or illness includes:
- an injury or illness that requires immediate treatment as an ‘in-patient in hospital’ (an ‘in-patient in hospital’ is a person who has been admitted to hospital and requires at least one overnight stay)
- amputation
- serious head, eye or burn injury
- degloving or scalping
- spinal injury
- loss of bodily function
- serious laceration
- exposure to a substance, which requires medical treatment within 48 hours.

WHAT IS A DANGEROUS INCIDENT?

A dangerous incident exposes someone to a serious risk to their health or safety, such as:
- the uncontrolled escape, spillage or leakage of a substance
- uncontrolled implosion, explosion or fire
- uncontrolled escape of gas, steam or of a pressurised substance
- electric shock
- falls from height of any plant, substance or the like
- the collapse, overturning, failure or malfunction of, or damage to any plant
- the collapse or partial collapse of a structure
12.2.3 Post Accident / Incident

Before recommencing diving after any serious accident, any injured diver should have a full medical examination.

12.3 Investigation of Accidents and Incidents

12.3.1 Secure the Scene

The scene should remain undisturbed. If there has been a death, serious injury or any dangerous incident, the site and ALL EQUIPMENT including cylinders, breathing apparatus etc. MUST NOT BE REMOVED OR ALTERED IN ANY WAY.

In any case where component malfunction was likely, or was suspected to have been a likely cause of a serious accident, this equipment should be sealed immediately.

Where a fatality has occurred, all equipment should be left in the condition that it was in at the time of the accident until it has been investigated by the relevant authorities.

NOTE: Notwithstanding the above, the breathing gas supply should be isolated to retain the remaining gas. During such isolation, the number of turns, any undue force or other actions required to isolate the gas supply, should be noted and recorded.
12.3.2 Investigation Report

In addition to existing legal requirements to record and report incidents, accidents and injuries, the University will investigate and document all diving-related incidents, accidents and injuries. Appropriate action to prevent further occurrences will then be taken. This will be done in consultation with staff and their representatives. The investigation report will contain the following:

- A summary of all aspects of the event occasioning the injury or death, specifying:
  i. the name and address of the injured diver;  
  ii. the date, location and time of the incident;  
  iii. details of the diving experience of the injured diver, if injured whilst diving;  
  iv. full details of the incident and cause (if known) or possible contributing factors;  
  v. the nature of the injury sustained by the diver; and  
  vi. the diving coordinator’s recommendations to prevent a recurrence.

- Full narrative statements from all persons (including the supervisor, diver and diver’s attendant) engaged in the relevant diving operation and who can detail any information pertinent to the occurrence of the incident.

- Such medical reports, in relation to the diver, as are available, are compiled both before and after the occurrence of the incident.

- Full details of the type of diving apparatus used by the diver, in particular noting the condition of such equipment immediately after the incident including, in the appropriate case:
  i. whether cylinder valves were opened or closed and to what extent;  
  ii. remaining pressures in cylinder;  
  iii. the position of the emergency supply valve;  
  iv. the type of breathing gas used; and  
  v. turn off breathing supply and record the number of turns required.

The following link to the University’s WHS website provides more detail about accident/incident investigation and reporting:
### Appendix A  Glossary and Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATA</td>
<td>Atmosphere. A measurement of pressure.</td>
</tr>
<tr>
<td>Bail-out system</td>
<td>An independent air supply worn and activated by a diver to counter an out of air, low on air or contaminated air situation. Also referred to as an ‘emergency air supply’.</td>
</tr>
<tr>
<td>BCD</td>
<td>Buoyancy control device.</td>
</tr>
<tr>
<td>Bottle bank</td>
<td>A group of two or more high pressure breathing air cylinders, yoked together and used in conjunction with a regulator to deliver air to a diver.</td>
</tr>
<tr>
<td>Bottom time (BT)</td>
<td>The total elapsed time from when a diver leaves the surface to the time (next whole minute) at which ascent is commenced, measured in minutes.</td>
</tr>
<tr>
<td>Breathing hoses</td>
<td>Hoses attached to a regulator that is designed to supply air to the diver and operate at near ambient pressure.</td>
</tr>
<tr>
<td>Buddy diver</td>
<td>A member of a group of two or three divers.</td>
</tr>
<tr>
<td>Buddy line</td>
<td>A line used to connect two or more divers, allowing them to maintain contact.</td>
</tr>
<tr>
<td>Combined dive</td>
<td>The bottom times of more than one dive, added together and treated as bottom time for a single dive for the purposes of determining decompression requirements. DCIEM tables say surface interval of less than 15 minutes are combined.</td>
</tr>
<tr>
<td>Competency equivalent</td>
<td>A level of competency in a specific task attained through training and experience that is equal to that a qualification required to perform that task.</td>
</tr>
<tr>
<td>Competent person</td>
<td>A person who has acquired, through training, qualifications or experience (or combination of these) the knowledge and skills to enable that person to safely perform a specified task.</td>
</tr>
<tr>
<td>Compression (recompression) chamber</td>
<td>A surface chamber in which persons may be subject to pressures equivalent to or greater than those experienced underwater, or which simulate those experienced on an actual dive. Hyperbaric chamber also.</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardiopulmonary resuscitation.</td>
</tr>
<tr>
<td>Current line</td>
<td>A line deployed behind a boat in conditions of strong current to facilitate the recovery of divers from the water. Also called a ‘Mermaid Catcher’.</td>
</tr>
<tr>
<td>DAN</td>
<td>Diver’s Alert Network.</td>
</tr>
<tr>
<td>Diver’s Attendant (DA)</td>
<td>The Diver's Attendant is usually at the surface.</td>
</tr>
<tr>
<td>Term</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Decompression illness (DCI/DCS)</td>
<td></td>
</tr>
<tr>
<td>The term covers the conditions known as decompression sickness (bends) and arterial gas embolism, but does not include barotrauma of ascent. Results from the formation of gas bubbles in the body.</td>
<td></td>
</tr>
<tr>
<td>Decompression schedule</td>
<td></td>
</tr>
<tr>
<td>A specific decompression procedure enumerated as ‘stops’ (see below) for a given combination of depth and bottom time as listed in a decompression table.</td>
<td></td>
</tr>
<tr>
<td>Decompression stop</td>
<td></td>
</tr>
<tr>
<td>The specified length of time which a diver must spend at a specified depth to allow for the elimination of sufficient inert gas from the body to allow safe ascent to the next decompression stop or the surface.</td>
<td></td>
</tr>
<tr>
<td>DCIEM</td>
<td></td>
</tr>
<tr>
<td>Canadian Defence and Civil Institute of Environmental Medicine.</td>
<td></td>
</tr>
<tr>
<td>DCIEM Tables</td>
<td></td>
</tr>
<tr>
<td>Decompression tables developed by DCIEM. To be used for Flinders University diving operations.</td>
<td></td>
</tr>
<tr>
<td>Dive Coordinator (DC)</td>
<td></td>
</tr>
<tr>
<td>The Dive Coordinator is responsible for the overall conduct of the dive, including any necessary pre/post dive activities, and the actual dive.</td>
<td></td>
</tr>
<tr>
<td>Diving Day</td>
<td></td>
</tr>
<tr>
<td>A 24 hour period during which dives are undertaken.</td>
<td></td>
</tr>
<tr>
<td>Dive Leader (DL)</td>
<td></td>
</tr>
<tr>
<td>The Dive Leader may either be the Dive Coordinator, or another Diver nominated by the Dive Coordinator, who is in the water.</td>
<td></td>
</tr>
<tr>
<td>Dive Plan</td>
<td></td>
</tr>
<tr>
<td>An operational plan prepared by the Dive Coordinator for a dive, or a series of dives. A dive plan must be prepared and submitted for every Flinders University dive which requires the UDO and relevant Dean of School approval prior to commencement of diving.</td>
<td></td>
</tr>
<tr>
<td>Daily Dive Log</td>
<td></td>
</tr>
<tr>
<td>Form, used to record details of each dive for every diver.</td>
<td></td>
</tr>
<tr>
<td>Diver Register</td>
<td></td>
</tr>
<tr>
<td>A listing of all divers experienced and qualified to dive for Flinders University according to these procedures – maintained by the FDAs.</td>
<td></td>
</tr>
<tr>
<td>Dive Team</td>
<td></td>
</tr>
<tr>
<td>The total number of personnel directly involved in any diving operation.</td>
<td></td>
</tr>
<tr>
<td>Dive master (DM)</td>
<td></td>
</tr>
<tr>
<td>A Dive master is an individual who has received training to a high level from one of the recreational diver training organizations. Competencies generally expressed in AS 4005.2 (named Recreational Dive Supervisor)</td>
<td></td>
</tr>
<tr>
<td>Dive Medical</td>
<td></td>
</tr>
<tr>
<td>1. Occupational / Commercial AS 2299.1; (for SCUBA Diving) renewed 12 monthly. Must be by a Doctor qualified in underwater medicine.</td>
<td></td>
</tr>
<tr>
<td>2. Recreational Diving Medical as per AS 4005.1; (snorkelling &amp; volunteer only) must be by a Doctor qualified in underwater medicine.</td>
<td></td>
</tr>
<tr>
<td>Diving Officer (DO)</td>
<td></td>
</tr>
<tr>
<td>See ‘UDO’ and ‘FDA’.</td>
<td></td>
</tr>
<tr>
<td>Diving Operation</td>
<td></td>
</tr>
<tr>
<td>Where personnel from Flinders University undertake a trip for the purpose of scientific or related underwater diving. The operation</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Effective bottom time (EBT)</td>
<td>The product of a diver’s actual bottom time for a dive, multiplied by their Repetitive Factor at the start of the dive (from any previous exposure to &gt; than ambient pressure).</td>
</tr>
<tr>
<td>Effective depth</td>
<td>For a dive at altitude, the depth of an equivalent dive at sea level.</td>
</tr>
<tr>
<td>Emergency air supply</td>
<td>See ‘bail-out system’.</td>
</tr>
<tr>
<td>Exceptional exposure dive</td>
<td>A dive where the maximum recommended dive time for a particular depth (shown by the limiting line in the decompression tables being used) is exceeded by a diver at that depth.</td>
</tr>
<tr>
<td>FDA</td>
<td>Faculty Diving Administrator</td>
</tr>
<tr>
<td>Flinders University Diver</td>
<td>Any Flinders University staff member or student, listed on the Flinders University Diver Register, who is undertaking a dive on behalf of the University.</td>
</tr>
<tr>
<td>Float line</td>
<td>A line attached to a diver, with a highly visible float on the surface.</td>
</tr>
<tr>
<td>Free flow primary air supply</td>
<td>A surface supplied breathing method in which air enters the helmet/mask in a continuous flow, and is not controlled by a demand regulator.</td>
</tr>
<tr>
<td>Incident</td>
<td>Any unplanned event that has the potential for damage, loss or injury to personnel and/or equipment and machinery. Also includes near miss.</td>
</tr>
<tr>
<td>Lifeline</td>
<td>A line of not less than 8 mm diameter attached to the diver at one end and tended from the surface at the other, which is capable of being used to haul the diver to the surface.</td>
</tr>
<tr>
<td>Limiting line</td>
<td>A line shown in some decompression tables, which indicates time limits (bottom times) beyond which the decompression tables shown are less safe.</td>
</tr>
<tr>
<td>LMSC</td>
<td>Lincoln Marine Science Centre, Port Lincoln.</td>
</tr>
<tr>
<td>Main air supply</td>
<td>The main supply of any diver’s breathing air, including air delivery from SCUBA cylinders, low pressure compressors or ‘bottle banks’.</td>
</tr>
<tr>
<td>Mermaid Catcher</td>
<td>See Current Line, above.</td>
</tr>
<tr>
<td>Mother Ship</td>
<td>A vessel (generally large) used as a base in remote areas, from which smaller vessels are used to conduct field or diving operations.</td>
</tr>
<tr>
<td>NAUI</td>
<td>National Association of Underwater Instructors - a diver training organization.</td>
</tr>
<tr>
<td>Night diving</td>
<td>Any diving activity conducted in the hours of darkness, including 1 hour prior to sunset and 1 hour after sunrise.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NQS</td>
<td>National Qualification Scheme. A National system set up to ensure a minimum level of training in various fields (e.g. recreational SCUBA training).</td>
</tr>
<tr>
<td>PADI</td>
<td>Professional Association of Diving Instructors world-wide diving instruction and training business.</td>
</tr>
<tr>
<td>Post Dive</td>
<td>Confirm the dive has been completed as per dive plan. Information recorded on Daily Dive log. If there were issues this should also be recorded.</td>
</tr>
<tr>
<td>Quick release</td>
<td>Able to be immediately released from closed position by the single operation of one hand.</td>
</tr>
<tr>
<td>Remote dive site</td>
<td>Any area of diving operation greater than 30 minutes from medical assistance.</td>
</tr>
<tr>
<td>Repetitive dive</td>
<td>Any dive conducted after a surface interval from a previous dive of more than 15 min. and less than 18 hours, or that has a repetitive factor at the start of the dive of greater than 1.0.</td>
</tr>
<tr>
<td>Repetitive factor (RF)</td>
<td>Using the short form DCIEM air decompression dive tables, a figure determined by the repetitive dive group (RG), and the length of the surface interval after a dive, and used for repetitive diving.</td>
</tr>
<tr>
<td>Repetitive group (RG)</td>
<td>After a dive conducted using the short form DCIEM air decompression dive tables, every diver will fall into a Repetitive Group category - determined by the dives they have completed in the previous 18 hrs.</td>
</tr>
<tr>
<td>Reserve air supply</td>
<td>The quantity of air that will enable a diver to return safely to the surface from the planned depth of the dive, completing all planned decompression stops.</td>
</tr>
<tr>
<td>Residual nitrogen</td>
<td>The nitrogen that remains dissolved in a diver’s body tissues after the diver has surfaced.</td>
</tr>
<tr>
<td>Risk Assessment</td>
<td>A process of identifying and setting up mechanisms for dealing with all risks involved in a particular field operation. It must be carried out for every School diving operation.</td>
</tr>
<tr>
<td>Safety Line</td>
<td>Lifeline, Buddy Line, Float Line or Current Line.</td>
</tr>
<tr>
<td>Saturation</td>
<td>That condition where a person’s body tissues are totally saturated with the particular inert gas element of the breathing medium in use.</td>
</tr>
<tr>
<td>Scientific diving</td>
<td>Diving performed for the purpose of professional scientific research, natural &amp; cultural heritage resource management, or scientific research as an educational activity.</td>
</tr>
<tr>
<td>SCUBA</td>
<td>Self-Contained Underwater Breathing Apparatus. Equipment designed to deliver air to a diver, using an open circuit system independent of the surface.</td>
</tr>
<tr>
<td>Shot rope</td>
<td>A rope running vertically from the surface (dive control position) and fixed to the worksite or bottom with a weight or attachment. The rope is marked with depth graduations to facilitate decompression stops at the correct depth. See also 'lazy shot'.</td>
</tr>
<tr>
<td><strong>SI</strong></td>
<td>Surface interval. Time between surfacing from one dive and commencing the next. If the SI is less than 15 minutes, then the second ‘dive’ is deemed a continuation of the first dive.</td>
</tr>
<tr>
<td><strong>Snorkelling</strong></td>
<td>‘Free swimming’ diving, or duck-diving - where fins and a mask and snorkel are used. Breath-hold diving.</td>
</tr>
<tr>
<td><strong>SPUMS</strong></td>
<td>South Pacific Underwater Medicine Society. Organization of medical professionals regulating diving medicine activities in Australasia.</td>
</tr>
<tr>
<td><strong>Stand-by Diver</strong></td>
<td>A diver sitting topside at the dive location capable of rendering assistance to a diver in the water in an emergency situation. This is usually the Surface Attendant</td>
</tr>
<tr>
<td><strong>SSBA</strong></td>
<td>Surface Supplied Breathing Apparatus. Equipment delivering air to diver from the surface.</td>
</tr>
<tr>
<td><strong>SSI</strong></td>
<td>SCUBA Schools International – a diver training organization.</td>
</tr>
<tr>
<td><strong>Surface Attendant (SA)</strong></td>
<td>A diver’s attendant, who does not enter the water (also see Diver’s Attendant).</td>
</tr>
<tr>
<td><strong>Team Leader</strong></td>
<td>Person with overall responsibility for conduct of a field research team. Has no authority over any decision made by a Dive Coordinator during the conduct of any diving operation.</td>
</tr>
<tr>
<td><strong>Tethered mode (in relation to SCUBA diving)</strong></td>
<td>SCUBA diving in which a diver is secured by a lifeline and tended by a diver’s attendant, or is secured to a tended float line.</td>
</tr>
<tr>
<td><strong>UDO</strong></td>
<td>Flinders University Diving Officer.</td>
</tr>
<tr>
<td><strong>Visiting Diver</strong></td>
<td>A trained, certified visiting diver (not a Flinders University student or staff member) who performs tasks relevant to scientific diving, who has a current diving medical certification and who is permitted to dive with the University by the UDO during his/her visit.</td>
</tr>
<tr>
<td><strong>Volunteer Diver</strong></td>
<td>A person not otherwise associated with Flinders University, who has volunteered to assist with diving, and meets the requirements necessary to be listed on the Diver Register.</td>
</tr>
<tr>
<td><strong>Within 6 months</strong></td>
<td>Some diver classifications have noted that particular certifications “are required within 6 months” (section 2.2); this means that the diver is required to receive that training within 6 months of their first dive with the University. This allows people time to fit into normal training schedules or some lee-way to find the appropriate trainer or provider</td>
</tr>
<tr>
<td><strong>Working ‘live’</strong></td>
<td>Where a vessel being used in the conduct of a diving operation is under power whilst Divers are in the water.</td>
</tr>
</tbody>
</table>
APPENDIX B  COMMUNICATIONS

As per Section 4.9 of this Manual, where divers are required to use a communications system, or wish to do so, the UDO or FDA should be consulted prior to diving and the guidelines below should be adopted.

B.1 Lifeline Signals

In situations where Flinders University Divers are required to operate with lifelines tethering them to the boat, attended by a surface Diver's Attendant, those Divers and the Surface Attendant must be familiar with the standard communication signals used in this situation - as listed below.

Line signals comprise either pulls or bells or a combination of both. A pull is a steady movement of the line, of at least 0.5 metre - always given singly. A bell is a sharp quick tug, always given in pairs where possible, e.g. five bells is given as:

1 pull to get the attention of the Surface Attendant/buddy; then 2 quick tugs (pause), 2 quick tugs (pause), 1 quick tug.

It should be noted that one bell does not exist as a signal on its own.

Signals - Attendant to Diver

a) 1 pull  To call attention. Are you OK?
b) 2 pulls  Am sending down a rope's end (or as previously arranged)
c) 3 pulls  You have come up too far. Go down slowly till we stop you
d) 4 pulls  Come up
e) 4 pulls followed by 2 bells  Come up / hurry up. Come up, surface decompression

Direction Signals

a) 1 pull  Search where you are
b) 2 bells  Go to the end of distance line / jack-stay / lifeline
c) 3 bells  Face shot lifeline then go right
d) 4 bells  Face shot lifeline then go left
e) 5 bells  Come in to your shot, or turn back if on a jackstay
**Signals - Diver to Attendant**

**General Signals**

<table>
<thead>
<tr>
<th>Signal Description</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 1 pull</td>
<td>To call attention / Made bottom / Reached end of jackstay</td>
</tr>
<tr>
<td>b) 2 pulls</td>
<td>Send me down a rope’s end (or as previously arranged)</td>
</tr>
<tr>
<td>c) 3 pulls</td>
<td>I am going down again</td>
</tr>
<tr>
<td>d) 4 pulls</td>
<td>May I come up?</td>
</tr>
<tr>
<td>e) 4 pulls followed by 2 bells</td>
<td>Assist me up / I want to come up</td>
</tr>
<tr>
<td>f) Succession of pulls (&gt;4)</td>
<td>EMERGENCY SIGNAL (ONLY to be used in extreme emergency). Need not be answered, but must be obeyed IMMEDIATELY.</td>
</tr>
<tr>
<td>g) Succession of 2 bells</td>
<td>Am fouled and need the assistance of another diver</td>
</tr>
<tr>
<td>h) Succession of 3 bells</td>
<td>Am fouled but can clear myself if left alone</td>
</tr>
</tbody>
</table>

**Working Signals**

<table>
<thead>
<tr>
<th>Signal Description</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 1 pull</td>
<td>Hold on / stop</td>
</tr>
<tr>
<td>b) 2 bells</td>
<td>Pull up</td>
</tr>
<tr>
<td>c) 3 bells</td>
<td>Lower</td>
</tr>
<tr>
<td>d) 4 bells</td>
<td>Take up slack lifeline / you are holding me too tight</td>
</tr>
<tr>
<td>e) 5 bells</td>
<td>Have found, started, or completed work</td>
</tr>
</tbody>
</table>
B.2 Hand Signals

All Flinders University divers should familiarise themselves with the hand signals most commonly required for SCUBA diving. The signals can be found in any ‘Open Water Diver’ manual - as released by diver training organizations.

- Distress/help
- Buddy breathe/share air
- Stop/hold it/stay there
- OK/OK?
- Danger
- OK?/OK (on surface at distance)
- Go up/going up
- Out of air/danger
- Something is wrong
- OK?/OK (one hand occupied)
- Go down/going down
B.3 Voice Communication

There is a range of different voice communication systems available, but it should be noted that all voice communications equipment used for scientific diving must meet standards described in the Australian Standards for Occupational Diving AS2299.2.

On any dive where use of a voice communication system has been made conditional on the dive taking place, the dive must not take place without a backup communications system being employed (e.g. a lifeline system), and all personnel involved in the operation being familiar with its use.
APPENDIX C  EMERGENCY PROTOCOLS

As all divers should be aware, many diving medical problems require immediate hyperbaric treatment if they are to be successfully resolved. In the field, or during transport to a recompression facility, the best first aid that can be administered for injuries/illnesses such as DCI or air embolism (and others) is oxygen delivered at as close to 100% as possible.

C.1 Examples

The flow chart on the next page may be used by Dive Coordinators as a basic template to design a site specific Emergency Response Protocol. The flow chart would slot into place along with the other steps required during an emergency, for example:

1) DRABCD. Recall all divers/swimmers to the boat or shore. If possible recover all equipment after any accident, and separate it from other equipment for subsequent examination. The Dive Leader may decide not to recover equipment if doing so would be unsafe or cause undue delay.

2) Seek appropriate medical assistance\(^2\) and follow any directions you are given. Refer to the WHS web site for a list of South Australian medical facilities and doctors trained in diving medicine;

3) Ensure other members of the dive team are not at risk and that all divers are present;

4) Ensure that in the emergency, no equipment has been left in a dangerous condition; secure the equipment and the site.

5) Organise evacuation to the nearest hospital or vacant recompression chamber as dictated by the circumstances, the casualty's condition, or medical advice (i.e., DES);

6) Record the details of the casualty's dive immediately, including where the accident occurred, and the sequencing of treatment. Conditions of the emergency can often lead to neglect in completing the diving log/record, which may make it impossible afterwards to determine the time for which the diver was in the water;

7) Ensure the diver's dive record sheets and (if possible) their log book are available for the doctor, particularly if recompression is required. Details of the diver's last medical examination may be useful if these can be obtained quickly;

8) When the immediate emergency has passed and all necessary steps have been taken to assist the casualty, a full record of the incident must be compiled by the Dive Coordinator. To help with this, all personnel involved in the incident should endeavour to make notes on what happened as soon as possible after the incident, obtaining details from other divers, noting exact times etc.;

9) NOTE: Divers who develop symptoms of decompression sickness, even on a dive apparently carried out according to the tables, all may also develop symptoms at a later time and require recompression. In such a situation, the dive buddy should be kept under observation for at least 24 hours after the incident.

\(^2\) Important: Any call for medical assistance will be improved if you give important information such as your location, the type of emergency (diving, boating, etc.), number of people affected, their approximate age and sex, signs and symptoms and vital signs (descriptions of pulse, breathing, consciousness level), first aid given and any changes in patient's condition.
C.2 Flow Chart:

**DIVING EMERGENCY OCCURS**

*START HERE*

Give immediate first aid as needed eg DRSABCD, oxygen

If life threatening, ring 000/112

Secure the scene and make sure no-one else is placed at risk

---

**Gather essential information and first aid/medical equipment**

- Number of patients? Names?
  (and identify yourself)
- Condition/ie conscious? Require resuscitation?
  Obvious major injury/problem?
- Progressive state of patient/s eg stable, good colour, getting worse?
- Brief diving history relating to incident?
- Medical equipment on site?

---

**Get someone else to get/record details of:**

- Patient’s full diving history for at least the preceding 48 hours
- Copies of dive logs and paperwork
- Recent and longer term medical history eg colds, previous injuries, medications etc
- Non-dive time use
- Names, addresses and medical training of people on site

---

**Contact using phone or radio**

**Primary Contacts**

Emergency phone: 000/112
Radio frequency: VHF16, UHF01

Diving Medical Doctor:
Diving Emergency Service (DES) 1800 088 200

Hyperbaric Chamber:
Give location and landmarks
Address:
Latitude:
Longitude:

**Secondary Contacts**

Emergency phone/Radio frequency:

University Diving Officer: 0427 837 280

Flinders University Security: 08 8201 2880

Associate Director, WHS: 0414 190 024

---

**Provide brief summary of the incident**

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**Stand-by for instructions**
APPENDIX D  DCIEM SHORT AIR TABLES

**Note:** The DCIEM Air tables are designed around an ascent rate of 18m/min(±3m), however, it is highly recommended that, wherever possible, all divers adopt an ascent rate of slower than 9 m/min when surfacing after any dive to a depth of 20 m or less.
APPENDIX E  SUMMARY OF RECORDS TO BE KEPT BY RELEVANT DIVERS

E.1 Diver

- Personal diving log
- Medical Certificates (by Doctor trained in underwater medicine).
- ‘Provide First Aid’ HLTAID003 and Oxygen training certificates.

E.2 Dive Coordinator

- Daily dive logs
- Daily onsite Risk Assessment
- Field trip forms.
- Dive Plan.
- Risk Assessments for the dive & any associated equipment.
- Daily equipment checklist.
- Participation forms (if relevant).

E.3 Faculty Dive Administrator (FDA)

- Faculty Dive Register
- Statements of Understanding
- New Diver Registration forms.
- Copies of all divers certificates e.g. Dive medicals, First aid, Oxygen, log books.
- Risk Assessments.
- Dive Plans.
- Field trip forms.
- Equipment service or defects lists.
- List of Dive Coordinators.
- Provide updates to the Faculty Committees on Diving activities.

E.4 University Diving Officer (UDO)

- Summary of dive registers.
- Dive Plans & associated Risk Assessment & Field trip forms.
- Annual audit and results.
- Copy of current policy & manual.
- Any documentation relation to changes to manual.
- Relevant legislation.
- Provide annual updates to the University Committee.
### Terms Under WHS 2012 Regulations as adopted by SA vs Flinders University Terms

<table>
<thead>
<tr>
<th>Category</th>
<th>Terms under WHS 2012 Regulations as adopted by SA</th>
<th>Flinders University Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Diving</td>
<td>General Scientific diver</td>
<td>can only dive to 21m (requires approval to dive to 30m)</td>
</tr>
<tr>
<td>Limited Scientific Diving</td>
<td>Limited Scientific Diver</td>
<td>can only dive to &lt;18 m, requires extra training and extra dives as set out in table 2.2</td>
</tr>
<tr>
<td>Incidental Diving</td>
<td>Restricted Student Diver; Incidental Scientific diver; Volunteer Diver</td>
<td>&lt; 9 m – Entry level and as set out in table 2.2.</td>
</tr>
</tbody>
</table>
APPENDIX G  CURRENT FIRST AID AND OXYGEN QUALIFICATIONS

Introduction
Where short-hand descriptions or abbreviations like ‘oxygen and first aid certification’ are used in this Manual, they can mean many different things depending on background and the current nationally approved courses.

For some diver classifications, particular certifications are required within 6 months (section 2.3). This means that the diver is required to receive the required training within 6 months of their first dive with the University. This allows people time to fit into normal training schedules or some lee-way to find the appropriate trainer or provider.

G.1 First Aid courses
  • “Provide First Aid” [HLTAID003] has previously been known among others as senior first aid. This is usually a 2 day course renewed every 3 years by a one day refresher.
  • Or if the risk assessment suggests one of these additional and advanced courses may be needed:
    • “Occupational First Aid”; [HLTSS00027]
    • “Remote Area First Aid”; [HLTAID005]

G.2 Oxygen courses
CPR and oxygen renewed annually
  • “Oxygen First Aid in Dive Accidents” [DAN AP, 21965VIC]
  • “Provide Advanced Resuscitation” [HLTAID007]
  • “Provide Advanced First Aid”; [HLTAID006]
**APPENDIX H: EXAMPLE DIVE PLANNING FLOWCHART**

### Diver Registration

**Restricted Student Diver**

**Qualifications**
- Open Water Diver Qualification or Higher
- Occupational Dive Medical
- Oxygen Provider (renew 12 monthly)
- Apply First Aid (renew 3 years)
- CPR (12 month)
- Diving Log Book (15 hours logged AND 10 Dives)

**Induction**
- UDO or FDA
- Diver Registration & New Diver Evaluation, Statement of Understanding Signed
- Induction & Diver Forms Signed
- DCIEM Tables & Shark Shields

**Dates of training checked Photocopies to FDA**

**Document copies kept by diver & copies filed by the FDA**

**Record in Faculty Diver Register**

### Dive Planning

**Dive Coordinator**

**Divers must be qualified, registered & completed induction & statement of understanding form**

**Develop**
- Dive Plan
- Emergency Response Plan
- Equipment Checklist, diving as a part of Field Trip Forms

**Approval of final Dive Plan, risk assessment & documents to FDA & then the UDO signs**

**On-Site Dive Coordinator**

**Daily Diving Risk Table**

**Dive Brief**
- Pre-dive equipment checklist
- Daily Dive Log

**Post Dive Phone-In**

**Complete Post Dive section ticked on Daily Dive Log**

### Field Trip Planning

**Field Trip Project Leader**

**Field Trip Documentation**
- Field Trip Form & Risk Assessment
- Contact Person/Checklist
- Individual Participant Checklist

**Risk Assessment**
- Field Trip
- Diving General
- Diving Equipment
- Diving Tasks
- Boat

**School Field Trips approval process**

**School Dean Approval (signature)**

**Document copies filed with School & with FDA**
APPENDIX I  DIVING FORMS

The Flinders University Diving Procedures Manual provides information and advice to all divers involved in underwater research and teaching activities in the University as well as providing a concise statement of approved procedures governing all Snorkel (breath hold) and Compressed Air diving operations conducted through the University. The aim of these procedures is to ensure users conduct their diving operations in a safe manner. The University has a series of mandatory forms which need to be completed by Divers, Coordinators and Diving Officers for various processes and projects.

The up-to-date forms are maintained by the WHS Unit on their web site and should be accessed from there.  

<http://www.flinders.edu.au/whs/working-safely/diving.cfm>

Diving Forms Listing only;

New Diver and Registration
- Diver Registration Form (DOCX 38KB)
- Diving Statement of Understanding (DOCX 38KB)
- New Diver Evaluation Form (DOCX 34KB)

Diving Medicals
- Doctors Listing (DOCX 38KB)
- Scuba Diver AS2299 (PDF 191KB)
- Snorkel Only AS4005 (DOCX 39KB)

New Project or Dive
- Field Trip Documentation
- Dive Plan Form (DOCX 38KB)
- Diving Risk Assessment Information (DOCX 54KB)

Daily Diving Operation
- Pre Dive Equipment Checklist (DOCX 27KB)
- Daily On-Site Risk Table (DOCX 39KB)
- Daily Dive Safety Log (DOCX 29KB)

Other Dive Information
- Diving Overseas Guidelines (DOCX 32KB)
- Nitrox Diving Guidelines (DOCX 35KB)

Some general SOP’s
- Lost Buddy (DOCX 49KB)
- Shark Shield - Alternate System (DOCX 73KB)
- Shark Shield - Freedom 7 (DOCX 73KB)