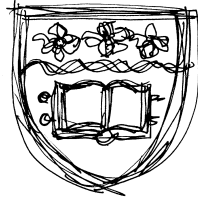


The University of Wollongong



SCUBA DIVING OPERATIONS MANUAL

This is a working document and subject to change

University of Wollongong Diving Safety Committee

Revised May 2011

Endorsed by

Institute for Conservation Biology

University of Wollongong

Modified from the University of Sydney SCUBA DIVING OPERATIONS MANUAL
(with their permission) and the draft document prepared by the working party
NSW Scientific Divers Committee
DRAFT Version: 21 February, 2003

Penny Berents	Australian Museum
David Booth	University of Technology Sydney
Rob Harcourt	Macquarie University
Graham Lloyd	University of Sydney
Heather Sowden	University of Sydney
Peter Steinberg	University of NSW

CONTENTS

1	INTRODUCTION.....	4
1.1	Referenced Documents.....	4
2	PERSONNEL & RESPONSIBILITIES.....	5
2.1	EMPLOYER	5
2.2	SCIENTIFIC DIVING ADVISORY COMMITTEE	5
2.3	DIVING OFFICER.....	5
2.4	DIVE COORDINATOR.....	6
2.5	DIVE LEADER	6
2.6	CLASSIFICATION AND COMPETENCY OF DIVERS	6
2.6.1	Scientific Scuba Diver	6
2.6.2	Restricted Scientific Diver	7
2.6.3	Visiting Scientific Diver and Visiting Restricted Scientific Diver	7
2.7	DIVER'S ATTENDANT.....	7
2.7.1	Availability and knowledge	7
2.7.2	Duties	8
2.8	STANDBY DIVER	8
2.8.1	General.....	8
2.8.2	Two divers in the water	8
2.9	HEALTH, FITNESS and FIRST AID.....	8
2.9.1	Health and fitness	8
2.9.2	First Aid for Diving Teams.....	9
3	Organization, Planning, and Records	10
3.1	GENERAL.....	10
3.2	ACTION PLAN	10
3.2.1	Diver Registration – see Appendix A.....	10
3.2.2	Dive Proposal – see Appendix B.....	10
3.2.3	On Site Pre-Dive Plan and Risk Assessment – see Appendix C.....	10
3.2.4	Diver's Record and Employer's Record of Dives – see Appendix E	10
3.3	DIVING PROCEDURES.....	11
3.3.1	Briefing for SCUBA DIVING.....	11
3.3.2	Restrictions on diving operations	11
3.3.3	Dive Teams	11
3.3.4	Night dives.....	11
3.3.5	Blue water diving for tracking particles.....	12
3.3.6	Use of decompression tables (UDT)	12
3.3.7	Safety stop.....	12
3.3.8	Diving with other institutions and divers from other institutions	12
3.3.9	Incident Reporting.....	12
4	EQUIPMENT FOR DIVING	14
4.1	EQUIPMENT STANDARDS AND MAINTENANCE	14
4.2	Service and maintenance of equipment	14
4.3	Personal diving equipment	14
4.4	Safety equipment for dive team.....	15
5.	SNORKEL DIVING.....	15
4.5	Other Snorkel Diving Considerations.....	15
4.6	Size and Supervision of Snorkel Teams.....	15
4.7	Briefing for Snorkel Diving.....	16
4.8	Other Safety Considerations	16
	APPENDIX A - DIVER REGISTER	17
	APPENDIX B - DIVE PROPOSAL FOR SCUBA (Air only)	19
	APPENDIX C - ON SITE PREDIVE PLAN AND RISK ASSESSMENT	23
	APPENDIX D – Hazard identification & risk assessment.....	25
	APPENDIX E - DIVE LOG / EMPLOYERS RECORD.....	27
	APPENDIX F – COMMUNICATIONS	29

APPENDIX G - DECOMPRESSION PROCEDURES 31

APPENDIX H - NITROX DIVING (INFORMATIVE) 32

APPENDIX I - AUSTRALIAN MUSEUM PROCEDURES FOR BLUE WATER DIVING
FOR FISH LARVAE BEHAVIOURAL STUDIES 33

APPENDIX J - IDAN DIVING INJURY REPORT FORM (PART) 34

APPENDIX K – Pre-Dive Briefing 36

APPENDIX L – MEDICAL CONTACTS 37

Medical Centre’s and General..... 37

Hyperbaric Chambers in Australia 38

Adelaide, South Australia Royal Adelaide Hospital (08) 8222 5116 38

Brisbane, Queensland Wesley Hospital (07) 3371 6033 38

Christchurch, New Zealand (03) 364 0045 38

Darwin, Northern Territory Royal Darwin Hospital (08) 8922 8888 38

Fremantle, Western Australia Fremantle Hospital (08) 9431 2233 38

Hobart, Tasmania Royal Hobart Hospital (03) 6222 8308 38

Melbourne, Victoria The Alfred Hospital (03) 9276 2269 38

Sydney, New South Wales Prince of Wales Hospital (02) 9382 3880 38

Townsville, Queensland Townsville General Hospital (07) 47962080 38

APPENDIX M – RECIPROCITY FORM FOR EXTERNAL DIVING ACTIVITIES 39

APPENDIX N – SAFE WORK PROCEDURE 40

1. SCUBA DIVING and SNORKELLING 40

2. Boat Use 40

APPENDIX O – RISK ASSESSMENTS 41

1. Scuba Diving ‘Toothbrush Island’ 41

2. Scuba Diving Bass Point – ‘Coal Loader’ and ‘Gutter.’ 41

APPENDIX P – THE GUTTER – DIVING MAP 57

APPENDIX Q – BUSHRANGERS BAY – DIVING MAP 58

1 INTRODUCTION

The University of Wollongong conducts Scientific Diving as a tool for teaching and scientific research.

The University of Wollongong acknowledges its responsibilities as an employer under *NSW Occupational Health and Safety Act 2000*, and *AS/NZS 2299.2:2002 Occupational Diving Operations – Scientific Diving – Part 2* (known hereafter as *AS/NZS 2299.2:2002*). All scientific diving operations will be conducted according to *AS/NZS 2299.2:2002*.

The purpose of this Scuba Diving Operations Manual is to assist in the interpretation of *AS/NZS 2299.2:2002* and to define roles and responsibilities in diving operations at the University of Wollongong. Through this Scuba Diving Operations Manual, the University of Wollongong seeks to manage its obligations by identifying hazards, removing any associated risks and/or installing control measures to prevent or minimise the level of risk to the employees, students, visitors, contractors, and volunteers engaged in underwater diving at the workplace. Employees, students, visitors and volunteers have responsibilities and obligations that are also identified in this manual.

This Scuba Diving Operations Manual will address and assist the planning and implementation of safe diving practices by identifying hazards, limitations and responsibilities of each member of the dive team through to administrative levels of management for all aspects of diving within the University of Wollongong. The Scuba Diving Operations Manual will be reviewed both periodically and as required.

This document outlines the procedures for conducting diving operations using compressed air, for scientific research or educational purposes under the auspices of the University of Wollongong.

Users of this manual should note the usage of the following terms:

must / shall : there are no circumstances under which this instruction may be ignored

should : normal diving practice requires that this instruction be obeyed but there may be circumstances in which it is appropriate for it to be relaxed

can / may : scientific diving may well benefit from using this technique

should consider : a helpful hint for scientific divers

1.1 Referenced Documents

The following publications are referred to in this manual.

- *AS/NZS 2299.2:2002 Occupational Diving Operations – Part 2: Scientific diving*
- *AS 2815.1-1992 Training and certification of occupational divers Part 1: SCUBA diving to 30m.*

This document should be read in conjunction with the Faculty of Science fieldwork guidelines (<http://www.uow.edu.au/admin/personnel/ohs/fieldworkmain.htm>), as they cover more general aspects of fieldwork that must also be taken into account when planning and carrying out scientific diving.

Copies of these and other referenced documents are available for reference from the Diving Officer.

2 PERSONNEL & RESPONSIBILITIES

2.1 EMPLOYER

The employer shall:

- install a management process to ensure that all scuba diving activities performed by staff, students, contractors, volunteers and visitors under the auspices of The University of Wollongong comply with the *NSW Occupational Health and Safety Act 2000*, AS/NZS 2299.2:2002 and this Diving Operations Manual and allocate necessary resources where applicable;
- appoint and consider recommendations made by the Scientific Diving Advisory Committee;
- periodically review the management process regarding diving practices under their responsibility; and
- Appoint Diving Officer(s) with the responsibilities as set out under 2.3.

2.2 SCIENTIFIC DIVING ADVISORY COMMITTEE

The University of Wollongong shall select and appoint a Scientific Diving Advisory Committee.

The Scientific Diving Advisory Committee should:

- review relevant legislation;
- periodically review the scientific diving operations manual; and
- provide information, guidance and advice to Directors, Heads of Schools, Supervisors, principal researchers, employees, staff, students and visitors regarding diving policy and practice, recommend and disseminate modifications of policy and practice to all levels of University management, staff, students and visitors

2.3 DIVING OFFICER

The University of Wollongong shall appoint Diving Officer(s) who shall be experienced Scientific Diver(s) trained to a level equal to or exceeding that specified in AS2815.1 (Commercial Diver Accreditation) and have a certificate to that effect issued by a relevant authority. They shall have at least 100 h of underwater diving experience and satisfy any other reasonable requirements as specified by the organization. The responsibilities of the Diving Officer are described in AS/NZS 2299.2:2002. The Diving Officer shall:

- (a) have the power to restrict, prohibit or suspend any diving operations, program or practice which he or she considers unsafe;
- (b) have the power to require such additional safety practices, procedures or equipment as he or she thinks necessary in any diving operation;
- (c) assess diver's competencies and record the evidence used in the assessment; and
- (d) be familiar with any legislation and guidelines which may apply to the diving operations, including AS/NZS 2299.2:2002, this manual, and ensure that any dive proposals that he/she approves comply with the requirements of this manual.

When approving dive proposals, the University of Wollongong Diving Officer(s) shall ensure that the divers are trained and competent for the diving operation proposed, and have any extra training they may require prior to particular dives. The Diving Officer(s) may authorize a diver to dive on certain diving operations only, depending on the qualifications of the diver and relevant legislative requirements. When approving dive proposals the Diving Officer(s) will also consider

the adequacy of the risk assessment and emergency plan for each dive proposal.

2.4 DIVE COORDINATOR

A dive coordinator appointed by the diving officer shall be present at all times while a diver is in the water or under pressure in a compression chamber. The dive coordinator shall be responsible for the safe conduct of diving and shall coordinate and direct the activity of the diving teams and ensure that all diving is carried out in accordance with this AS/NZS2299.2:2002.

A dive coordinator shall have at least 20 hours experience as a Scientific scuba diver and have experience in the diving, equipment and procedures used in the diving operation to be performed. They shall further:

- (a) be appointed in writing at the discretion of the diving officer to supervise diving operations; and
- (b) be able to recognize and manage diving emergencies and conduct pre-dive risk assessments. It is expected that the Dive coordinator will have undertaken Rescue Diver training, has a current Senior First Aid and Oxygen Provider training;
- (c) Satisfy any other reasonable requirements specified by the organization's Diving Officer; and
- (d) be familiar with this manual and ensure diving operations are carried out in accordance with its requirements.

2.5 DIVE LEADER

A dive leader is a person in charge of a specific part of a diving operation. A dive leader shall be-

- (a) the dive coordinator or a person appointed by the dive coordinator; or
- (b) A scientific diver or a visiting scientific diver with adequate knowledge and experience of the diving techniques and equipment to be used. It is expected that the Dive Leader will have undertaken Rescue Diver training, has a current Senior First Aid and Oxygen Provider training.

When a dive leader is the person in charge of a single group of divers who are diving in free-swimming SCUBA mode, that person shall take responsibility for any decisions required as the dive proceeds, in consultation with the dive coordinator where appropriate.

2.6 CLASSIFICATION AND COMPETENCY OF DIVERS

Every diver shall be classified as a restricted scientific diver, a scientific diver, visiting scientific diver or a visiting restricted scientific diver. All divers shall be made aware of their occupational health and safety responsibilities and the organisation's relevant procedures, including this manual.

2.6.1 Scientific Scuba Diver

In order to carry out scientific diving using scuba a scientific diver shall:

- (a) have a certification as an open water diver through a certified recreational instructor, or equivalent training through any other certification scheme;
- (b) have at least 25 hours of underwater diving experience;
- (c) demonstrate competency and satisfactory performance in diving theory and diving practical units as specified in AS/NZS 2299.2:2002;

- (d) be familiar with the pre-dive plan before diving;
- (e) dive in accordance with the pre-dive plan;
- (f) act as a buddy diver during the dive to others in his or her designated buddy group, unless diving alone in tethered SCUBA mode. Free-swimming buddy divers shall maintain effective two-way communication with each other at all times while in the water and be able to render assistance;
- (g) be on the Dive Register of his/her institution with a current diving medical; and
- (h) abide by the procedures for diving as described in AS/NZS 2299.2:2002 and this manual.

[NB this section will refer to specific Scientific Diving Course once available]

2.6.2 Restricted Scientific Diver

This category is specifically for persons who are involved in research requiring diving but who have limited diving experience and are deemed by the diving officer of their host institution not to have experience equivalent to a scientific diver.

As a minimum, a restricted scientific diver should-

- (a) be 18 years of age;
- (b) hold an open water diver certificate from a recognized SCUBA training and certifying organization;
- (c) have at least 20 h of underwater diving experience after certification;
- (a) only dive when conditions are suitable for untethered SCUBA mode;
- (e) not dive deeper than 18 m depth;
- (f) not act as a standby diver or a dive leader;
- (g) not dive as a restricted diver other than for a single initial period of up to 12 months; and
- (h) not use powered tools or lift bags.

2.6.3 Visiting Scientific Diver and Visiting Restricted Scientific Diver

There shall be full reciprocity for scientists who are qualified to dive under the auspices of scientific diving organisations outside Australia and New Zealand. The Diving Officer may issue a 'visiting scientific diver' or 'visiting restricted scientific diver' certification as appropriate, subject to special conditions.

The Diving Officer may arrange appropriate dives at the start of a visiting diver's stay in Australia so that person's overall competence to participate in the diving planned can be assessed.

2.7 DIVER'S ATTENDANT

2.7.1 Availability and knowledge

Dive teams shall have a divers' attendant who is competent to administer cardiopulmonary resuscitation (CPR) and oxygen resuscitation and have a working knowledge of the following:

- (a) Diving and the requirements of underwater work;
- (b) Signals in use (see Appendix F), in particular, the systems of hand and rope signals to be

used in the diving operations;

- (c) Decompression procedures; and
- (d) Diving equipment in use, including ancillary fittings such as pressure gauges, compressors and filters.

The diver's attendant shall not be engaged in any task other than that of diver's attendant while the dive team is in the water or under pressure.

2.7.2 Duties

The diver's attendant, or other person nominated by the dive coordinator, shall-

- (a) record the time of descent and surfacing of each diver;
- (b) maintain a constant vigil during a dive for divers surfacing at a distance from the boat or other dive control position;
- (c) assist in the recovery of divers and all equipment and samples from the water;
- (d) ensure that the dive flag is deployed; and
- (e) if tending a diver's lifeline, maintain the ability to communicate with the diver by means of that lifeline.

2.8 STANDBY DIVER

2.8.1 General

A standby diver shall be present whenever a single diver is underwater in tethered mode, and shall be a qualified diver and located on the surface, dressed and equipped to enable immediate entry into the water for the purpose of providing aid or assistance to a distressed diver. The dive profile of the standby diver shall be planned to allow all necessary assistance to be given to a distressed diver without the standby diver incurring a decompression commitment. The only exceptions to this shall be

- (b) in an emergency; or
- (c) when the depth of the water is such that the standby diver will automatically incur a decompression commitment.

NOTE: The surface standby diver may perform certain minor duties (e.g. tending the lifeline) provided the safety of the diver in the water is not compromised in any way.

2.8.2 Two divers in the water

Where two divers are in the water at the same time, one may act as standby diver for the other provided that both divers have no decompression commitment and maintain visual contact with, and direct access to, each other. That is, the buddy diver may act as the standby diver.

2.9 HEALTH, FITNESS and FIRST AID

2.9.1 Health and fitness

All divers must be certified as medically fit to dive in accordance with the requirements of AS/NZS 2299.1:1999 - Australian /New Zealand Standard: *Occupational Diving Operations - Part 1: Standard operational practice* (see Appendix L of this Standard). A certificate of fitness to dive shall have been issued within 12 months prior to diving by a medical practitioner appropriately trained in underwater medicine. All divers involved in diving shall also ensure that

they are fit to dive. Fitness should be maintained by exercise and regular diving. Where a diver has not dived for a period of time exceeding six months, the diver shall carry out a check out dive or program of dives with the diving officer or the diving officer's delegate qualified to undertake such an evaluation.

2.9.2 First Aid for Diving Teams

All divers and attendants should be trained in first aid so that, as a minimum, they are able to-

- (a) control bleeding;
- (b) administer 100% oxygen to spontaneously breathing patients and oxygen-enriched resuscitation to non-breathing patients using the oxygen resuscitation equipment at the dive site;
- (c) care for an unconscious patient; and
- (d) Carry out cardiopulmonary resuscitation.

NOTES: 1) The above requirements are usually met by a first aid course leading to certification, incorporating or supplemented by an oxygen administration course.

2) It may in some circumstances be possible to make adequate provision for the delivery of emergency first aid with not all personnel being trained, provided that no less than two persons are trained and available to ensure first aid will be available if required.

3 Organization, Planning, and Records

3.1 GENERAL

Diving procedures must be carried out according to the provisions of AS/NZS 2299.2:2002 and this manual. Many scientific locations are remote from search and rescue, medical and recompression facilities and risk assessment and planning must take this into account.

3.2 ACTION PLAN

All diving must be in accordance with the following action plan. More detailed guidance on the processes of hazard identification, risk assessment and risk control can be found in Appendix D. Documentation of these processes should be carried out using the forms referred to in Appendices B and C as a minimum.

3.2.1 Diver Registration – see Appendix A

All staff, students, contractors, visitors and volunteers who are required to scuba dive in diving operations conducted by the University of Wollongong must register and be approved for diving by the Diving Officer. Each diver will be approved as a scientific diver, a restricted scientific diver, visiting scientific diver or a visiting restricted scientific diver.

3.2.2 Dive Proposal – see Appendix B

The Dive Proposal must be approved by the Diving Officer before every diving operation. It comprises a dive proposal, risk assessment and emergency plan.

- (a) Dive Proposal - details of location of diving operations and dive team.
- (b) Risk Assessment - identify possible hazards and precautions to be taken.
- (c) Emergency Plan - identify emergency facilities and procedures.

3.2.3 On Site Pre-Dive Plan and Risk Assessment – see Appendix C

At the dive site before every dive, the dive coordinator, divers, divers' attendants and any non-diving support personnel shall discuss in detail and agree upon the pre-dive plan and update the risk assessment. The On Site Pre-Dive Plan and Risk Assessment must be lodged with the Diving Officer on return to the University of Wollongong.

3.2.4 Diver's Record and Employer's Record of Dives – see Appendix E

All divers shall keep and maintain a permanent record of all diving undertaken for the duration of the diver's working life. At the end of a diving operation the Dive Coordinator shall deposit with the Diving Officer, a copy of each diver's log for dives conducted during that diving operation.

The diver's permanent record of diving usually takes the form of a logbook, which shall include:

- (a) the diver's photograph;
- (b) next of kin information;
- (c) diver's name, current address, date of birth and signature;
- (d) a record of medical examinations conducted for the purpose of scientific diving;
- (e) a record of diving activity undertaken; and
- (f) A record of accidents and incidents including decompression treatment(s).

The logbook shall be presented at each diving medical examination. The diver's record of dive (including a brief summary of any incidents or accidents) should be entered into this permanent record of diving at the completion of each dive, and signed by the Dive Coordinator for verification.

3.3 DIVING PROCEDURES

3.3.1 Briefing for SCUBA DIVING

Before commencement of any SCUBA diving operation, a briefing must be given by the Dive Coordinator, 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 is given in Appendix K.

3.3.2 Restrictions on diving operations

Diving operations shall only be carried out when:

- the dive does not involve planned decompression stops;
- the maximum depth does not exceed 30 metres; and
- the dive does not involve "Cave diving" as defined by the Cave Diving Association of Australia (<http://www.cavedivers.com.au/>).

3.3.3 Dive Teams

Dive teams must include a Dive Coordinator and should comprise

- two divers and a competent boat person or shore watch (diver's attendant) OR
- three divers and a competent boat person or shore watch (diver's attendant) OR
- more than three divers grouped into buddy pairs (preferably) or trios, but no more, and one competent boat person or shore watch (diver's attendant) OR
- when diving in "Sheltered conditions", divers are permitted to dive without a boat person or shore watch (i.e. in a team of two divers).

Note: Sheltered conditions are defined as: depth less than 10 metres, underwater visibility at least equal to the depth, wave height less than 0.5 metre, current nil to slight, and daylight hours

3.3.3.1 Dive Leader

Before the divers enter the water, one member of each group of divers shall be designated by the Dive Coordinator as the underwater dive leader of that group. Prior to the dive, the Dive Leader should confirm the means to be used by the group for summoning attention and recalling divers to the surface, such as banging on the tank with the knife. The Dive Leader should also confirm that any diver feeling distressed or uncomfortable may terminate the dive at any time.

3.3.4 Night dives

In addition to normal diving procedures, the following procedures must be followed for a night dive:

- the entry and exit points shall be adequately and distinctively illuminated; and

- Every diver shall carry at least two lights, one of which may be a chemically-activated light stick.

Consideration should be given to the use of other safety measures according to circumstances.

3.3.5 Blue water diving for tracking particles

These procedures are not appropriate for open ocean blue water diving, but are to be applied to blue water diving in waters 20-40 m deep over the continental shelf. For open ocean blue water diving, the use of a mother ship for coordination must be considered and appropriate procedures developed in conjunction with the Diving Officer.

Diving will be conducted from a small, outboard-powered boat, with a dive team comprising two divers and one boat operator. The operator will circle the divers' bubbles or preferably an inflatable torpedo float at idle speed at a radius of 20-30 m. A dive flag shall be displayed throughout. If the boat operator loses sight of the divers' bubbles, he/she motors at idle speed into the wind constantly scanning the area until the divers surface. The boat operator keeps track of vessels in the vicinity, and ensures that they do not come too close to the divers.

If conditions are such that the boat operator cannot easily keep track of the diver's bubbles at the surface, one of the divers must be equipped with a light line attached to a small surface float to enable the boat operator to stay in the vicinity of the divers. In addition to normally-required dive gear, divers must be equipped with a dive computer and a compass.

3.3.6 Use of decompression tables (UDT)

All dives including repetitive dives must be calculated using DCIEM tables (Canadian Defence and Civil Institute for Environmental Medicine). Divers should note that UDT, the licensee and manufacturer of DCIEM tables have recommended amendments covering the use of these tables (see Appendix G).

Maximum bottom times must be reduced according to Table 3.1 AS/NZS 2299.2:2002 if diving is conducted without a recompression chamber on site (see Appendix G). Dive computers may be used for the diver's own information.

3.3.7 Safety stop

On each dive, divers should do a safety stop of at least 3 min at between 3m and 6m.

3.3.8 Diving with other institutions and divers from other institutions

When a dive operation is conducted by The University of Wollongong all divers must be registered with the University of Wollongong and follow the procedures of AS/NZS 2299.2:2002 and this manual.

When The University of Wollongong divers participate in diving operations conducted by another institution, they must follow the procedures of AS/NZS 2299.2:2002, this manual and the procedures of the institution conducting the diving operation.

3.3.9 Incident Reporting

All unusual incidents, unexpected hazards, accidents and injuries will be reported as soon as possible to the relevant Diving Officer and to the Occupational Health and Safety Unit (via an incident report form – see below). Where injuries occur or there are mechanical breakdowns or accidents that affect completion of the work, safe return of staff or students, or endanger life, these must be reported verbally as soon as practical to the contacts at the University. Less serious events shall be reported to the Diving Officer on return to the University.

The Dive Coordinator must investigate all incidents, hazards, injuries and breakdowns with the

other people involved to determine the causes and any actions that may be taken to prevent a recurrence of the incident. Detailed guidance on the investigation of accidents and incidents can be found in Section 7 of AS/NZS 2299.2:2002.

When an event occurs that affects work or future work, a debriefing must be held soon after the return of the dive team, in accordance with procedures developed by the OHS Unit. The debriefing should cover issues such as the adequacy of the planning, risk assessment and preparation for the dive, any incidents which occurred and how they were managed and any lessons learned that could benefit future dives by members of the Department concerned or other Departments.

The University's Incident Report Form (<http://www.uow.edu.au/admin/personnel/ohs/ohs.html>) shall be used for reporting incidents as per the University's Policy on Accident Reporting. A Divers Alert Network (DAN) incident report must also be completed – see Appendix J.

4 EQUIPMENT FOR DIVING

4.1 EQUIPMENT STANDARDS AND MAINTENANCE

Each member of the diving team must know the capabilities and limitations of any equipment used. The dive leader must select appropriate equipment, based on the work site conditions and the dive plan. Equipment must not be altered, modified, or changed in any way that might impair its safe and efficient operation.

All diving equipment, including cylinders, regulators and accessories necessary for the safe conduct of the diving operation must be:

- of approved design, sound construction, adequate strength, free from any defect and maintained in a condition that will ensure its continued operation for the purpose and depths for which it was originally designed and subsequently used; and
- Examined, tested, overhauled and repaired in accordance with the manufacturer's recommendations and used in accordance with AS/NZS 2299.2:2002.

4.2 Service and maintenance of equipment

Regulators, buoyancy vests, gauges and metering equipment shall be serviced according to manufacturer's requirements. Any malfunction must be rectified without delay.

Records of maintenance and testing of the University of Wollongong and personal equipment used in the University of Wollongong diving operations will be kept in the Institute for Conservation Biology for at least two years.

4.3 Personal diving equipment

Each diver shall use the following equipment:

- (a) open-circuit scuba, complete with demand regulator and cylinder with quick -release harness. The cylinder must be marked with "AIR" at least 50mm high and in a contrasting colour to the cylinder
- (b) face mask;
- (c) swimming fins;
- (d) snorkel for surface swimming;
- (e) weight belt or weight jacket with quick release closure;
- (f) submersible contents gauge for measuring remaining air pressure in cylinder;
- (g) wetsuit or protective clothing appropriate to the condition of work and the temperature of the water;
- (h) buoyancy compensator of an approved design that is inflatable by mouth and with a compressed air cylinder;
- (i) alternative air supply, either a spare second stage regulator such as an octopus regulator, a pony bottle, or a second stage regulator incorporated into the oral inflation hose of the buoyancy compensator;
- (j) watch or elapsed time indicator or dive computer;
- (k) depth gauge or dive computer;

- (l) divers knife; and
- (m) safety sausage.

4.4 Safety equipment for dive team

The following equipment must be available at the dive site

- (a) oxygen resuscitation equipment;
- (b) first aid equipment;
- (c) dive flag; and
- (d) communication equipment – e.g. marine radio &/or mobile phone.

5. SNORKEL DIVING

As a general guide, snorkel diving by UOW personnel should only be used as an observation and/or a light recovery or collection technique. No difficult or strenuous work of any kind should be attempted using snorkel diving, without implementation of appropriate safety precautions and the written permission of the University Diving Officer.

An individual wishing to participate in snorkeling activities through the university must be listed on the University Dive Register and must satisfy the University Diving Officer of their fitness to take part in such activities.

Although no 'formal' qualifications are required of snorkel divers, they are required to complete a detailed Dive Proposal for any trip – including a Risk Assessment for any tasks to be performed (or refer to any Risk Assessment already prepared for these tasks).

4.5 Other Snorkel Diving Considerations

Other than that listed above, no special qualifications are required of snorkel divers except that they will be reasonable swimmers, comfortable in the water, and observe common sense rules regarding boating and swimming safety. Inexperienced snorkellers must undertake a snorkel diving familiarization session with the University Diving Officer or delegate, and should initially practice snorkelling in either a swimming pool, or other sheltered, shallow waters, until they attain enough confidence to swim in deeper water.

As mentioned, the University Diving Officer (or delegate) has the right to assess any snorkel diver new to the Dive Register, and a formal assessment test would comprise an assessment of 'snorkelling specific' skills, as determined by the University Dive Officer or delegate.

4.6 Size and Supervision of Snorkel Teams

The minimum size of a snorkel team performing low risk tasks in low risk conditions is two, which could comprise either a snorkeller and a surface Coordinator, or two buddy snorkellers (in this case, both divers must remain in visual contact with each other at all times during the activity). In areas where there are higher risks, the snorkel team shall consist of either one snorkeller and a surface Coordinator, or two buddy snorkellers and a surface Coordinator, depending on the experience of the snorkel team and the task being undertaken (as assessed by the University Dive Officer or delegate).

Irrespective of the size of the snorkel team all members should be paired up (with experienced snorkellers buddying with novices or inexperienced snorkellers) and remain within sight of each other at all times.

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 diving.

Where large groups (i.e. > 10 people) conduct snorkeling operations, there must be at least one person on watch at the surface for every ten 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, and the group must be informed that if the whistle is sounded, all snorkellers must return to the beach/boat. All snorkellers must be paired up (experienced with novice if possible) and pairs must stay together during the dive.

First aid and oxygen equipment and trained operators must be on site while any diving operation is in progress.

4.7 Briefing for Snorkel Diving

Before commencement of any snorkel diving operation, a briefing must be given by the Dive Coordinator, 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 in Appendix K may be adapted for this purpose.

4.8 Other Safety Considerations

A dive flag must be displayed adjacent to any snorkeling site at all times. During Snorkel diving operations, an appropriate first aid kit must be available on site, with at least one person who is adequately trained in first aid. As well, oxygen resuscitation equipment must be on site, along with a person certified in the use of such equipment and an adequate supply of medical oxygen.

As with SCUBA divers, snorkel divers must wear suitable protection from environmental conditions such as cold, sun, marine animals, abrasions etc.

APPENDIX A - DIVER REGISTER

Attach Photo here

NAME :

ADDRESS:

PH NO: EMAIL:

SECTION:

PERMANENT STAFF/ TEMPORARY STAFF/ VISITOR/ STUDENT /VOLUNTEER

Supervisor's Name Account Code

NEXT OF KIN CONTACT

ORIGINAL SCUBA QUALIFICATION..... Date:

SUBSEQUENT QUALIFICATIONS (attach copies)

(List First Aid, Diver First Aid (CPR) and Commercial Diver AS2815 if you have them)

Qual: Date:

Qual : Date:

Qual : Date:

Qual : Date:

MOST RECENT SCUBA MEDICAL: (attach copy) Date :

PASS/FAIL

DATE OF BIRTH.....

NUMBER OF DIVES : HOURS LOGGED :LOG BOOK SIGHTED.....

Have you been involved in a diving related accident? Yes/No

(if yes give details).....

.....

VISITORS PLEASE STATE YOUR HOME INSTITUTION:

.....

I have read the University of Wollongong Scuba Diving Operations Manual and the AS2299.2:2002. NOTE – it is essential that you read this Diving Operations Manual before to participate in ANY diving with UOW.

Signature:..... Date:.....

Approved as:-

Scientific Scuba Diver, Dive Coordinator, Restricted Scientific Diver,

Visiting Scientific Diver, Visiting Restricted Scientific Diver

Diving Officer's Signature: Date:

APPENDIX B - DIVE PROPOSAL FOR SCUBA (Air only)

Dive Coordinator:.....**Date of last medical:**.....

Contact Phone Number:

List of dive team members:

Name:.....Date of last medical:.....

Name:.....Date of last medical:.....

Name:.....Date of last medical:.....

Name:.....Date of last medical:.....

Name:.....Date of last medical:.....

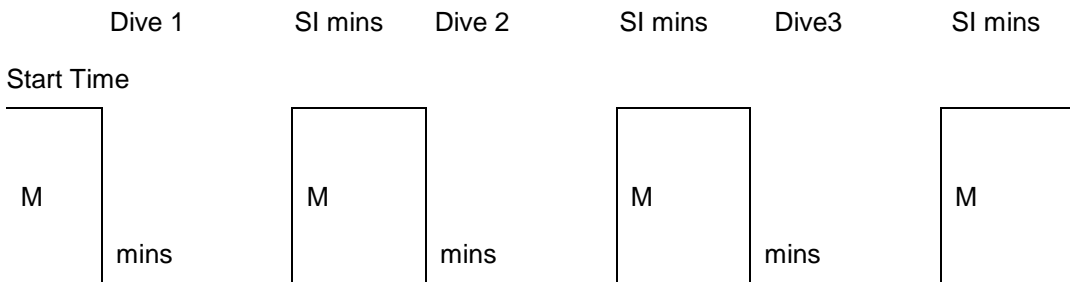
Person to be notified on leaving and returning to the University/Field Camp:.....

Dive Location:

Dates: From to

Type of dive(s) (e.g. boat (incl. name of boat), shore, drift)

Dive Profile (specify as far as possible intended depth and duration of proposed dive(s):
.....



Risk Assessment: Does this site have a registered risk assessment and emergency plan?

Yes: (Sighted by Diving Officer)..... Copy on site?

No: I affirm that a risk assessment will be conducted on site.....

Is this a 'Sheltered Open Water Site' as specified in 3.3.3 in the Scuba Diving Operations Manual? Yes/No

Equipment: I affirm that all scuba equipment to be used has been serviced in the last 12 months as required by AS/NZS 2299.2:2002. I also confirm that the Oxygen Resuscitation Equipment will be taken on the dive trip.

Signature

Dive Coordinator.....Date

General Risk Assessment for Dive Proposal

1. What type of work is proposed?

.....
.....

2. Do you anticipate any adverse weather conditions? YES / NO

If yes, what precautions will you take?

.....
.....

3. What is the anticipated depth?

(Scuba diving will not be conducted at depths > 30 metres)

4. Do you anticipate strong currents? YES /NO

(Divers should be able to swim comfortably against any current or a drift dive should be conducted)

If yes, what precautions will you take?

.....
.....

5. Will divers be subject to altitude during the diving operation? YES/NO

If yes, what precautions will you take?

.....
.....

6. Are you planning repetitive dives?YES/NO

(If more than two dives a day are conducted on three consecutive days, diving must not be carried out on the fourth day.)

If yes, what precautions will you take?

.....
.....

Dive Proposal approved by Diving OfficerDate.....

Two person dive team approved subject to conditions as specified in 3.3 in the University of Wollongong Scuba Diving Operations Manual? Yes/No

Employer's Record Submitted Date.....

(Signature of Diving Officer)

Emergency Plan for Dive Proposal

2 copies:

- COPY FOR DIVE TEAM
- COPY TO BE RETAINED BY DIVING OFFICER

Emergency phone number: 000 (NOTE: mobile phones – if no coverage with your provider DIAL 112 will use any provider for emergency)

Divers Emergency Service (DES): 1-800-088-200 (in Australia)
61 8 8212 9242 (International)

Dive Site: If you are diving at one site, what are the directions to the site for Emergency Services?

.....

Where is/are the nearest hospital/s to all your proposed dive site(s) ? (see Appendix L Operations Manual)

.....

Where is the nearest recompression chamber?

Where is your home base while carrying out the proposed dives?

.....

Phone number at home base

Do you have oxygen resuscitation and first aid kits at the dive site? Yes/No

Have you collected the Defibrillator from the Photocopy Room Bldg35,G18? Yes/no

Transport to/from site including vehicle registration numbers and/or boat type:.....

.....

Communications with dive team: Mobile

Satellite phone

Boat Radio VHF/HF/28Mhz (circle type of radio)

Does the boat have EBIRB? Yes / No

Emergencies involving fatalities, serious injuries or serious decompression illness must be reported as soon as possible to the University contacts. The Occupational Health and Safety Unit must also be promptly informed of any such emergencies in order to comply with legal requirements. The OHS coordinator's telephone number is 02 4221 3914. For an afterhours emergency, contact Security on 02 4221 4555.

Incident report forms may be found at: <http://staff.uow.edu.au/ohs/index.html>

APPENDIX C - ON SITE PREDIVE PLAN AND RISK ASSESSMENT

TO BE COMPLETED BEFORE EACH DIVE AND RETURNED TO THE DIVING OFFICER

Site Registration:

Location:

Maximum Depth for each team:.....

.....

Bottom Time for each team:.....

.....

Residual Nitrogen for each diver.....

.....

.....

.....:

ENVIRONMENTAL FACTORS - Do these constitute a hazard?

Wind strength and direction	Yes/No	Altitude	Yes/No
Wave Action (Seas, Swell, Surge)	Yes/No	Contaminated waters	Yes/No
Current and Tide	Yes/No	Time of day	Yes/No
Water temperature	Yes/No	Entrapment hazards	Yes/No
Thermal exposure (sun, temp, rain)	Yes/No	Isolation- remote sites	Yes/No
Visibility	Yes/No	Excessive noise	Yes/No
Underwater terrain	Yes/No	Dangerous marine animals	Yes/No
Shipping	Yes/No	Water Inlet	Yes/No
		Other (please specify).....	

If Yes, describe and hazard and precautions taken: -

TASK RELATED HAZARDS

Are there any non-routine tasks to be performed which may increase the level of risk associated with the dive? Yes/No

If yes, describe hazard and precautions taken

Do the dive(s) include?

- Multiple ascents Yes/No
- Repetitive dives Yes/No
- Multi-day dives Yes/No
- Excessive exertion Yes/No

Are all divers fit to dive? (eg prior physical exertion, fatigue, recent illness, dehydration, alcohol imbibed) Yes/No

Other (please specify)

HYPERBARIC / PHYSIOLOGICAL FACTORS

Dive coordinator

Name

.....

(Signature).....

If Yes, describe hazard and precautions taken: -

Dive Team...Names & Signatures

.....

.....

.....

.....

APPENDIX D – Hazard identification & risk assessment

Hazard identification and risk assessment should be performed at the dive proposal stage and as part of the pre-dive plan. Hazards that arise during a dive should be immediately brought to the attention of the Dive Coordinator so that the dive plan can be altered to ensure the health and safety of the divers or the dive aborted.

The following steps are used to manage occupational health and safety risks arising in scientific diving operations.

- Step 1. Identify hazards and hazardous tasks
- Step 2. Assess the nature of the risk created by those hazards and hazardous tasks
- Step 3. Assess the degree of exposure to the risks and the potential of the risks to cause injury or illness
- Step 4. Eliminate or control the risks
- Step 5. Review the adequacy and effectiveness of the adopted control measures.

Risk assessment of diving operations should identify and take into account the following:

- Environmental conditions, e.g.
 - strength and direction of wind and its potential influence on diving operations and emergency response capability
 - atmospheric temperature and humidity currents and tides
 - time of day
 - water temperature
 - visibility
 - underwater terrain
 - entrapment hazards
 - contaminants,
 - isolation of the site, etc
- Task factors, e.g. complexity, non-routine tasks may increase level of risk
- Hyperbaric/Physiological factors, e.g.
 - depth and duration of dive
 - frequency of diving, multiple ascents, repetitive diving, multi-day diving
 - breathing gas
 - exertion required to reach site and conduct tasks
 - immediate pre-dive fitness

- altitude exposure
- excessive noise, etc
- Factors relating to associated activities, e.g. manual handling, boat handling and dive platforms, etc
- Emergency response factors, e.g. location and availability of emergency facilities and systems, etc
- Other hazards that could be encountered during the diving operations, e.g. dangerous marine animals, water inlets, shipping, use of hazardous substances, biological pollutants or explosives, etc.

Hazard identification and risk assessments should be documented using the forms in appendices B and C, together with any additional documentation relevant to the particular situation.

Risks in diving operations should be controlled in accordance with the hierarchy of controls i.e.

1. Elimination – if the risk cannot be adequately controlled, no diving should take place
2. Substitution – if an alternative method is available that entails less risk, it should be considered
3. Design – procedures and equipment should be designed to minimise risk
4. Isolation – divers and others should be separated from identified hazards if feasible
5. Administrative – covers many aspects of dive safety including adequate training, supervision and experience of the dive team members, adequate organisation and planning of the dive and selection of appropriate means of communication to minimise risk; the dive plan should minimise the duration and degree of each diver's exposure to risk
6. Personal Protective Equipment – appropriately designed and sized equipment provided, used and maintained and the limitations of the equipment understood in order to minimise risks to the dive team.

Further guidance on hazard identification, risk assessment and control can be found in Appendix G of AS/NZS 2299.2:2002.

APPENDIX E - DIVE LOG / EMPLOYERS RECORD

University of Wollongong

Diving Safety Program

Dive Log

UNIVERSITY OF WOLLONGONG

DIVING SAFETY PROGRAM

MONTH _____ YEAR _____ DIVER _____

DATE	ACCOMPANIED BY	DC	LOCATION	*	PURPOSE AND COMMENTS	GP	DEPTH	START	FINISH	TOTAL	GP

1. Submit this log sheet to the Diving Officer, University of Wollongong following period of diving activity.
2. During any twelve month period, each certified diver must log one at least one dive to the depth of certification during any twelve (12) month period.
3. Separate detailed reports must be filed on the appropriate forms with the Diving Officer for all accidents, incidents, or potentially dangerous experiences, and equipment failure.

DC Initials of dive coordinator.

* Purpose: R - Research, C - Class project, T - Training, S - Sport, O - Other

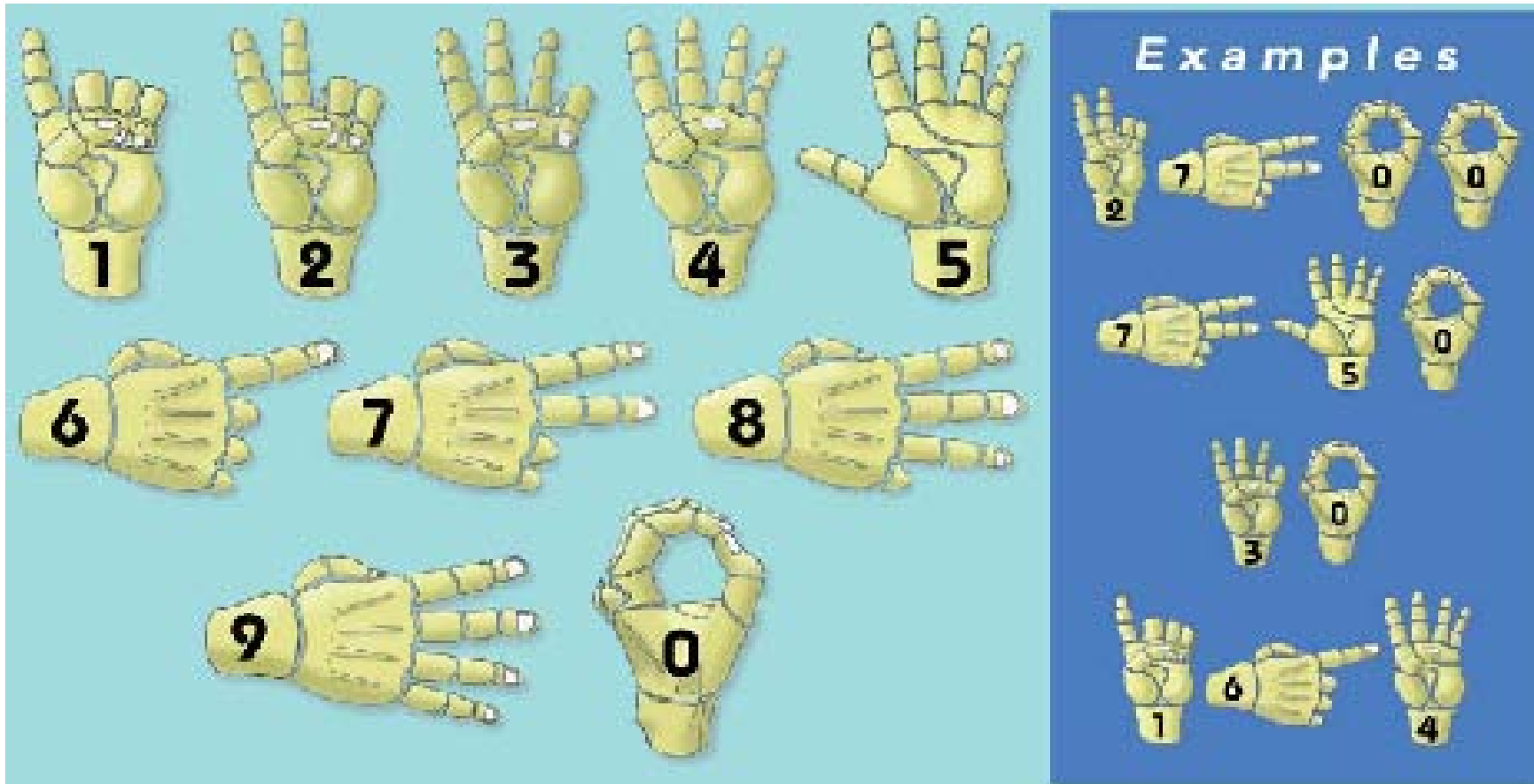
Gp Repetitive Dive Group before and after each repetitive dive

Cert # & depth	Name (print)	Signature/date	Instructor signature/date	Diving officer/date

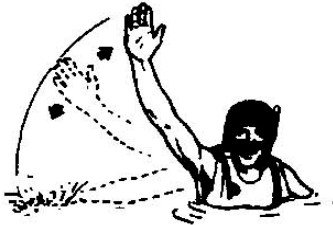
APPENDIX F – COMMUNICATIONS

All UoW divers should familiarize themselves with the hand signals most commonly required for SCUBA diving. All divers must be familiar with the standard communication signals listed below.

One hand numbering hand signals.



Generic Signals



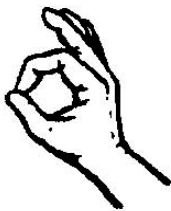
Distress/help



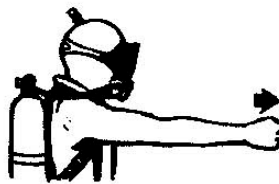
Buddy breathe/share air



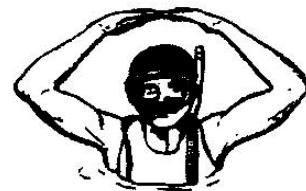
Stop/hold it/stay there



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

APPENDIX G - DECOMPRESSION PROCEDURES

Reduced Bottom Time Limits For Remote Locations

Maximum depth of dive (m)	Maximum bottom time (mins)		
	COLUMN A Chamber within 2 hours	COLUMN B Chamber within 2 – 6 hrs	COLUMN C Chamber over 6 hours
3	No limit	240 (400)	190
6	240 (400)	240 (300)	190
9	180	140	110
12	120	70	55
15	75	60	50
18	50	40	30
21	35	30	20
24	25	20	15
27	20	15	10
30	15	10	10

Amendments to DCIEM procedures

- (a) The rate of ascent should be a maximum of 15 metres \pm 3 metres per minute.
- (b) A 3 minute stop is recommended for all dives below 12 metres.
- (c) Repetitive dives should always be shallower than the previous dives.
- (d) A maximum depth of 27 metres is recommended for second dives and 15 metres for the third dive.
- (e) The group letter for each repetitive dive must be higher than the RG from the preceding dive. Otherwise add one letter to the preceding dive RG and use the higher RG letter. e.g. 1st dive RG = C, 2nd dive RG = D, 3rd dive RG = E
- (f) If more than two dives a day are conducted on three consecutive days, diving should not be carried out on the fourth day.

APPENDIX H - NITROX DIVING (INFORMATIVE)

Nitrox is a combination of oxygen and nitrogen where the percentage of oxygen is increased from standard air, which is approximately 21% oxygen and 79% nitrogen. In Nitrox diving the mix of oxygen is from 22% to 40% in water depths less than 130fsw/40msw.

Nitrox divers have less nitrogen in their tanks than air divers. For an equivalent dive they absorb less nitrogen into their bodies and are less exposed to Decompression Sickness (DCS). Using Standard Air Dive Tables on Nitrox gives increased physiological safety, especially for people who are more at risk from DCS. The increased risk factors include: obesity, illness, older age, fatigue, heavy exertion during and or after a dive, are reduced by the use of Nitrox. Divers can benefit through increased bottom time and shorter surface intervals if they are not affected by such risk factors.

Diving cylinders used for Nitrox are defined with a Green band and labeling these are only used for Nitrox, this is to avoid a person using a tank thinking it is air when it is Nitrox or using a Nitrox tank thinking it is for air. This sort of mistake can result in a diver extending the no decompression limits thinking he is using Nitrox or, alternately, thinking he has air, the diver exposes himself to central nervous system (CNS) oxygen toxicity with Nitrox. Regulators using less than 39% oxygen can be used for air or Nitrox diving. Divers must check their own Nitrox fills with an oxygen analyzer and sign off on the fill log at the fill facility. Cylinders are tagged describing fill pressure, oxygen, analysis date, maximum oxygen depth, name of user and cylinder number.

A standard Nitrox course will equip a diver with the understanding and training to use this gas mix to increase safety margins, while working to air dive tables. It can increase dive times and shorten dive time intervals.

Information sourced from Technical Diving International

APPENDIX I - AUSTRALIAN MUSEUM PROCEDURES FOR BLUE WATER DIVING FOR FISH LARVAE BEHAVIOURAL STUDIES

These procedures are not appropriate for true blue water diving (open ocean), but are to be applied to blue water diving in waters 20-40 m deep over the continental shelf. For open ocean blue water diving, the use of a mother ship for coordination must be considered and appropriate procedures developed in conjunction with the Diving Officer. Procedures developed for blue-water diving by zooplankton biologists involving a shot line, tethers between divers and the line, and a 'look-out' diver are inappropriate for a research protocol that requires the divers be free to follow a released larva.

Equipment

In addition to normally-required dive gear, divers must be equipped with a dive computer and an orange 'safety sausage'. If conditions are such that the boat operator cannot easily keep track of the diver's bubbles at the surface, one of the divers must be equipped with a light line attached to a small surface float to enable the boat operator to stay in the vicinity of the divers. A 'shot line' is not used because the divers are following a released fish. Divers have a compass, and a hand-held flow meter.

Boat operation

Diving is conducted from a small, outboard-powered boat, with a dive team comprising two divers and one boat operator. The operator circles the divers' bubbles at idle speed at a radius of 20-30 m. The boat operator monitors geographic position, and supplies the divers with new fish for release as needed. A dive flag is displayed throughout. If the boat operator loses sight of the divers' bubbles, he/she motors at idle speed into the wind constantly scanning the area until the divers surface. The boat operator keeps track of vessels in the vicinity, and ensures that they don't come too close to the divers

APPENDIX J - IDAN DIVING INJURY REPORT FORM (PART)

IDAN DIVING INJURY REPORT FORM (DIRF) PAGE 1

DAN Chamber Code

Chamber Patient ID #

Last Name _____
 First Name _____ MI _____
 Daytime Telephone # _____
 Evening Telephone # _____
 Male Female
 Date of birth (mm/dd/yy) _____
 Height _____ cm or ft/in Weight _____ kg or lbs
 (circle) (circle)

Are you a certified Diver? Yes No
 If yes, year first certified _____
 Highest certification _____
 Number of dives in past 12 months _____
 Number of dives in past 5 years _____

Are you a volunteer for **Project Dive Exploration**
 or **Project Safe Dive**? Yes No

Check all medications you currently take

- Decongestant/Antihistamine/Allergy
- None Inhaler for Asthma
- Diarrhea Oral Asthma Drug
- Motion Sickness Pain Killer
- Anticonvulsant Anti-Malarial
- Insulin Other (List in 'Comments')

Check all current health problems

- None Heart Disease
- Asthma Back Pain
- High Blood Pressure Joint/Muscle Pain
- Diabetes Other (List in 'Comments')

Check all past health problems

- None Ear/Sinus Surgery
- Treated for DCS/AGE Asthma
- Back Surgery/Problem Ear Barotrauma
- Lung Surgery/Problem Other (List in 'Comments')

Cigarette~ smoking

Do you smoke cigarettes? Yes No
 If yes, how many packs per week? _____
 How many years have you smoked? _____

For women

Menstruating during dive series? Yes No
 Do you take oral contraceptives? Yes No
 Are you pregnant? Yes No
 Are you post-menopause? Yes No

Where were you diving when you were injured?

- Ocean/Sea Lake/Quarry/River
- Tank/Pool Cavern/Cave
- Dry Chamber Other (List in 'Comments')

Dive series (all dives or altitude exposures with less than a 48-hour surface interval)

Dive Site: Country _____ State/Province _____
 Total # Days Diving _____ Total # of Dives _____
 Last Dive Ended: Date _____ Time: _____
 Max Depth in Series _____ fsw or msw (circle)
 Max Depth of Last Dive _____ fsw or msw (circle)
 Were all dives at sea level? Yes No
 If no, altitude of dive site _____ ft or m (circle)
 Altitude exposure between dives? Yes NO
 Did you make any safety stops? Yes No
 Decompression stops required (& made) by dive
 table or computer? Yes No

How did you conduct your dive when injury occurred?

- Dive Computer Follow Another Diver
- Dive Table Other (List in 'Comments')

Altitude exposure after diving

Within 48 hours of last dive? Yes No
 If yes, surface interval _____ hrs
 Altitude (if known) _____ ft or m (circle)
 Commercial Fixed Wing Mountain Travel
 Unpressurized Fixed Wing Helicopter
 Medical Evacuation Aircraft

Purpose of dive when injury occurred

- Recreational Instructor/Guide
- Technical Scientific
- Student Military
- Other (specify) _____

Breathing apparatus when injury occur~

- Open-Circuit Scuba Closed-Circuit (1 Ear Barotrauma)
- Semi-Closed Scuba Surface-Supplied (3 Other (List in
- Other (specify) _____

Breathing gas when injury occurred

- Air Heliox % O2 _____
- Nitrox (EAN) % O2 _____ Other (List in 'Comments')

Diving dress when injury occurred

- Wetsuit Swimsuit
- Diveskin Drysuit
- Other (specify) _____

Problems during dive when injury occurred

- Out of Air Nausea / Dizziness
- Rapid Ascent Injury
- Missed Decompression Cold
- Heavy Exertion Short of Breath
- Equipment (List in 'Comments') Other (List in 'Comments')

DIVER'S DESCRIPTION *(To be completed by diver)*

- How did you feel before your last dive? Good Fair Tired Exhausted Hungover
 Did you have symptoms before your last dive? Yes No *If yes, explain in 'Comments.'*
 Did you have symptoms underwater or at altitude? Yes No *If yes, explain in 'Comments.'*
 Were you given emergency oxygen? Yes No *If yes, list date, time, method, flowrate & duration in 'Comments.'*
 Were you treated in a chamber for this dive series? Yes No *If yes, list where and when in 'Comments.'*

In order of onset, what were your symptoms and their severities on a scale of 1 (<i>minor</i>) to 10 (<i>worst possible</i>) ?	Where were the symptoms in your body?	What dates and times did the symptoms occur?
1st:		
2nd:		
3rd:		
4th:		
5th:		
6th:		

COMMENTS *(other symptoms, changes in symptoms, of dive profile, emergency O2, recompression, etc)*

RELEASE FOR RESEARCH STATEMENT I understand that this form is for research only and not for insurance purposes. All information will be kept strictly CONFIDENTIAL. I understand that International Divers Alert Network (IDAN) may contact me for clarification. This release authorizes any hospital, medical clinic, physician, nurse and/or the keeper of medical records to divulge, give, and/or permit to copy any information pertaining to the medical condition or history of the undersigned to IDAN only. I agree that a copy of this statement shall have the same validity as the original.

Diver Signature _____

Date _____

Signature of Witness to Release _____

Date _____

APPENDIX K – Pre-Dive Briefing

The Dive Coordinator for each dive is responsible for conducting a pre-dive briefing in the presence of the entire dive team. The content of this briefing must include the following information and must be modified to take into account any details specific to the dive site or operation being undertaken:

Details of equipment to be used during dive including SCUBA, oxygen equipment, first aid and safety equipment;

1. Allocation and description of tasks for each dive team member;
2. Complete details of the dive plan, including depth and duration, dive termination procedures, and emergency procedures;
3. Details of water conditions, including currents, visibility, seafloor conditions, etc.
4. Communication signals;
5. Minimum air limits, and dive termination points;
6. Answers to any questions that arise;
7. Ensure all information is entered on the On Site Pre-dive Plan and Risk Assessment (Appendix C); and
8. Ensure all divers complete their buddy checks prior to entering water.

After every dive, the Dive Coordinator must conduct a post-dive debrief with all dive personnel on the trip including the following:

Check the health of all divers;

1. Noting all tasks achieved;
2. Recording equipment problems encountered, and ensuring equipment is labeled for repair;
3. Notify each diver of their dive details including bottom time, and maximum depth; and
4. Ensure that each diver completes the Dive Log/Employers Record (Appendix E).

APPENDIX L – MEDICAL CONTACTS

Medical Centre's and General

Diving Emergency Service / Diver Alert Network.	1800 088 200
State Emergency Service and Ambulance	000 (112 on some mobiles)
Prince of Wales Hospital (Barker Street, Randwick) Hyperbaric Unit	Ph. 02 9382 3883
NSW Marine Police	Ph. 1800 658 784
Dr. Michael Charles Illawarra Occupational Health, 33 Swan Street, Wollongong (\$120 dive medical 2006)	Ph. 02 4229 611
Dr. Tom Rosenthal Suite 3, 32-36 Uranga Parade, Miranda (\$100 dive medical 2006)	Ph. 02 9525 3464
Dr. Andrew Keller Sydney Airport Medical Centre, Level 3, Sydney International Airport, Mascot	Ph. 02 9667 4355
Dr. Caron Jander Inergise, Level 2, 44 Market Street, Sydney	Ph. 02 9299 7199
Dr. T.A. Anderson 11/130 Elizabeth Street, Sydney	Ph. 02 9397 1100
Dr. Bruce Greig MLC Medical Centre Suite 1003, MLC Centre, Martin place, Sydney	Ph. 02 9232 5477
Dr. Susan Willis, Dr. Phillip Brown, Dr. Amr Marzaouk University Health Service University of Sydney, Sydney	Ph. 02 9351 3484

Hospitals

Milton/Ulladulla Hospital (Princes Highway)	Ph. 02 4455 1333
Shellharbour Hospital (Madigan Boulevard)	Ph. 02 4296 6666
Wollongong Hospital (Loftus Street)	Ph. 02 4222 5000
Shoalhaven District Memorial Hospital (Shoalhaven St, Nowra)	Ph. 02 4421 3111
Prince of Wales Hospital, Sydney NSW	Ph. 02 9382 3880

Hyperbaric Chambers in Australia

Adelaide, South Australia Royal Adelaide Hospital (08) 8222 5116

Brisbane, Queensland Wesley Hospital (07) 3371 6033

Christchurch, New Zealand (03) 364 0045

Darwin, Northern Territory Royal Darwin Hospital (08) 8922 8888

Fremantle, Western Australia Fremantle Hospital (08) 9431 2233

Hobart, Tasmania Royal Hobart Hospital (03) 6222 8308

Melbourne, Victoria The Alfred Hospital (03) 9276 2269

Sydney, New South Wales Prince of Wales Hospital (02) 9382 3880

Townsville, Queensland Townsville General Hospital (07) 47962080

APPENDIX M – RECIPROCITY FORM FOR EXTERNAL DIVING ACTIVITIES

UNIVERSITY OF WOLLONGONG REQUEST FOR DIVING RECIPROCITY FORM

VERIFICATION OF DIVER TRAINING AND EXPERIENCE

Name.....

This letter serves to verify that the above listed person has met the training and pre-requisites as indicated below, and has completed all requirements necessary to be certified as a Restricted Scientific Diver as established by the University of Wollongong Diving Safety Manual, and has demonstrated competency in the indicated areas. The University of Wollongong adheres to the Australian Standard for Scientific Diving (AS 2299.2:2002).

The following is a summary of this diver's personnel file regarding dive status at UoW:

Original diving certification -

Original diving authorization (Campus/Organisation) -

Current diving medical examination -Expiry Date.....

Most recent checkout dive -

Scuba regulator/equipment service/test -.....

CPR training (UOW) -Expiry Date.....

Oxygen administration (DAN)-Expiry Date.....

Senior First aid (UOW) -.....Expiry Date.....

Date of last dive -Expiry Date.....

Depth Certification -.....

Any restrictions or waivers? NO if yes, explain:

Please indicate any specialty certifications or training:

This is to verify that the above individual has applied to be a certified scientific diver at the University of Wollongong.

Diving Safety Officer:

Andy Davis Date_____

adavis@uow.edu.au

APPENDIX N – SAFE WORK PROCEDURE

- 1. SCUBA DIVING and SNORKELLING**
- 2. Boat Use**

APPENDIX O – RISK ASSESSMENTS

- 1. Scuba Diving ‘Toothbrush Island’**
- 2. Scuba Diving Bass Point – ‘Coal Loader’ and ‘Gutter.’**

RISK ASSESSMENT

Risk Assessment Task/ Location	1. Scuba Diving 'Toothbrush Island'
---------------------------------------	--

Person Conducting the Risk Assessment	Corrine de Mestre	Position	Technical Officer	Date	May 2008	Signature	
--	-------------------	-----------------	-------------------	-------------	----------	------------------	--

Supervisor of the Area	Andy Davis	Position	Dive Safety Officer	Date	May 2008	Signature	
-------------------------------	------------	-----------------	---------------------	-------------	----------	------------------	--

Referenced UOW Guidelines, Legislation, Australian Standards, Code of Practice:

Risk Management Guidelines OHS106.7

Faculty of Science Fieldwork Safety Guidelines and Procedures

Procedures for Staff and Students Travel

AS/NZS 2299.2:2002 Occupational Diving Operations – Part 2: Scientific Diving.

AS 2815.1 – 1992 Training and Certification of Occupational Divers Part 1: Scuba Diving to 30 metres.

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
1	Slip, trip or fall whilst entering/exiting boat (resulting in injury)	M	<ul style="list-style-type: none"> - Do not dive in high winds (e.g. > 20knots). - Hold onto secure handle or rail when entering boat, keeping legs bent and balancing weight. - Choose the safest entry point (rear or side of boat - this may be dependent on sea conditions). - Use safe diver entry technique (holding mask, regulator in, BCD inflated). - Enter the water one at a time and signal once safely in the water. 		Dive Officer and individuals diving			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
2	Disorientation during dive	M	<ul style="list-style-type: none"> - Study the dive site map (if available). - Discuss the dive during the pre-dive procedures with the whole group or with your buddy. - Descend the anchor line. - Stay with your dive buddy (or with your group). - Dive with someone experienced with diving at the location. - Use compass and landmarks for orientation. 	<ul style="list-style-type: none"> - avoid diving in poor visibility. At this site visibility drops off over several days of northerly winds. 	As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
3	Bite/sting from marine animal	M	<ul style="list-style-type: none"> -Take due care whilst diving. - Wear gloves when sampling. - Do not poke or prod unknown or dangerous animals. - Be aware of the species likely to be encountered within the site area (especially poisonous species). - Do not put your hand inside dark holes or crevices. - Always carry a first aid kit with items specific for treating bites/stings. 		As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
4	Dehydration/thermal exposure to extremes.	M	<ul style="list-style-type: none"> - Do not dive in high winds (e.g. > 20knots). - Inform staff at the university of location and estimated return date and time. - Discuss the dive during the pre-dive procedures with the whole group or with your buddy. - Always dive by the dive plan and proposal. - Ensure that the dive team has a means of communicating with the shore (i.e. a marine radio). - Always carry a mobile phone, EPIRB, and emergency equipment (i.e. flares, V sheet, etc) for emergencies. - Adequate exposure protection to be worn by all divers (i.e. wetsuit 3-7mm thickness, hood etc.) 	<ul style="list-style-type: none"> - Ensure warm, dry clothes are available to change into after diving. 	As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
5	Entrapment	M	<ul style="list-style-type: none"> - Study the dive site mud map (if available). - Stay with your dive buddy (or group) - Avoid entering into caves in this site) - Ensure diver's skills are up to date and procedures in the event of entrapment occurring are in place. 	<ul style="list-style-type: none"> - Always carry a diving knife. 	As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
6	Accident/collision/capsize during boat travel	M	<ul style="list-style-type: none"> - Do not dive in high winds (e.g. > 20knots). - Notify the contact person at the University once the diving party have left the boat ramp and are returning home. - Discuss the dive during the pre-dive procedures with the whole group or with your buddy. - All drivers must be licensed and experienced in open water and registered on the University Dive Register (see Biology Administration Officer). - Follow boat craft rules. - Only carry the maximum safe number of passengers. - Carry a Type 1 life jacket for all passengers. <p>Carry an EPIRB and a marine radio to communicate with the shore, at all times.</p>		As Above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
7	Nitrogen Narcosis	L	- This dive site reaches a maximum depth of 15 metres (50 feet) therefore nitrogen narcosis is unlikely (usually occurring at >100 feet depth).		As Above			
8	Decompression Sickness	L	<ul style="list-style-type: none"> - Dive by the dive plan and proposal. - Keep bottom time to within no decompression limits. - The rate of ascent should be a maximum of 15 metres +/- 3 metres per minute. - Always do a 3-5 min safety stop at 5 metres depth at the end of your dive. - Stay above the recreational depth limit of 30 metres. - If repetitive dives ensure that sufficient surface interval to avoid decompression sickness. - Take oxygen resuscitation equipment on all scuba/snorkelling trips and ensure people are trained in using it. 		As Above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk Score*	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
9	Currents	L	<ul style="list-style-type: none"> - Use a mermaid line - Strong currents that might trouble a diver have never been observed at this location. 					

RISK ASSESSMENT

Risk Assessment Task/ Location	2. Scuba Diving Bass Point – ‘Gravel Loader’ and ‘Gutter’						
Person Conducting the Risk Assessment	Corrine de Mestre	Position	Technical Officer	Date	May 2008	Signature	
Supervisor of the Area	Andy Davis	Position	Dive Safety Officer	Date	May 2008	Signature	

Referenced UOW Guidelines, Legislation, Australian Standards, Code of Practice:

Risk Management Guidelines OHS106.7

Faculty of Science Fieldwork Safety Guidelines and Procedures

Procedures for Staff and Students Travel

AS/NZS 2299.2:2002 Occupational Diving Operations – Part 2: Scientific Diving.

AS 2815.1 – 1992 Training and Certification of Occupational Divers Part 1: Scuba Diving to 30 metres.

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk score *	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk score *	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
1	Slip, trip or fall on rocky shore whilst entering dive site (resulting in injury)	M	<ul style="list-style-type: none"> - Do not dive in high winds (e.g. > 20knots). - Never scuba dive with less than 2 people. - All divers must be qualified (minimum - Open Water License). - Choose the safest route/entry point (this may be dependent on sea conditions and tides). - Use safe diver entry technique (holding mask, regulator in, BCD inflated). - Enter and water when water level surges high (always observe depth). - Exit water with extreme caution when large swell. 	<ul style="list-style-type: none"> - Take extreme care. - wear booties with gripped soles. - Due to shallow depth in some parts of the entry point it is advisable to slide into the water instead of using the 'safety jump.' 	Dive Officer and individuals diving			

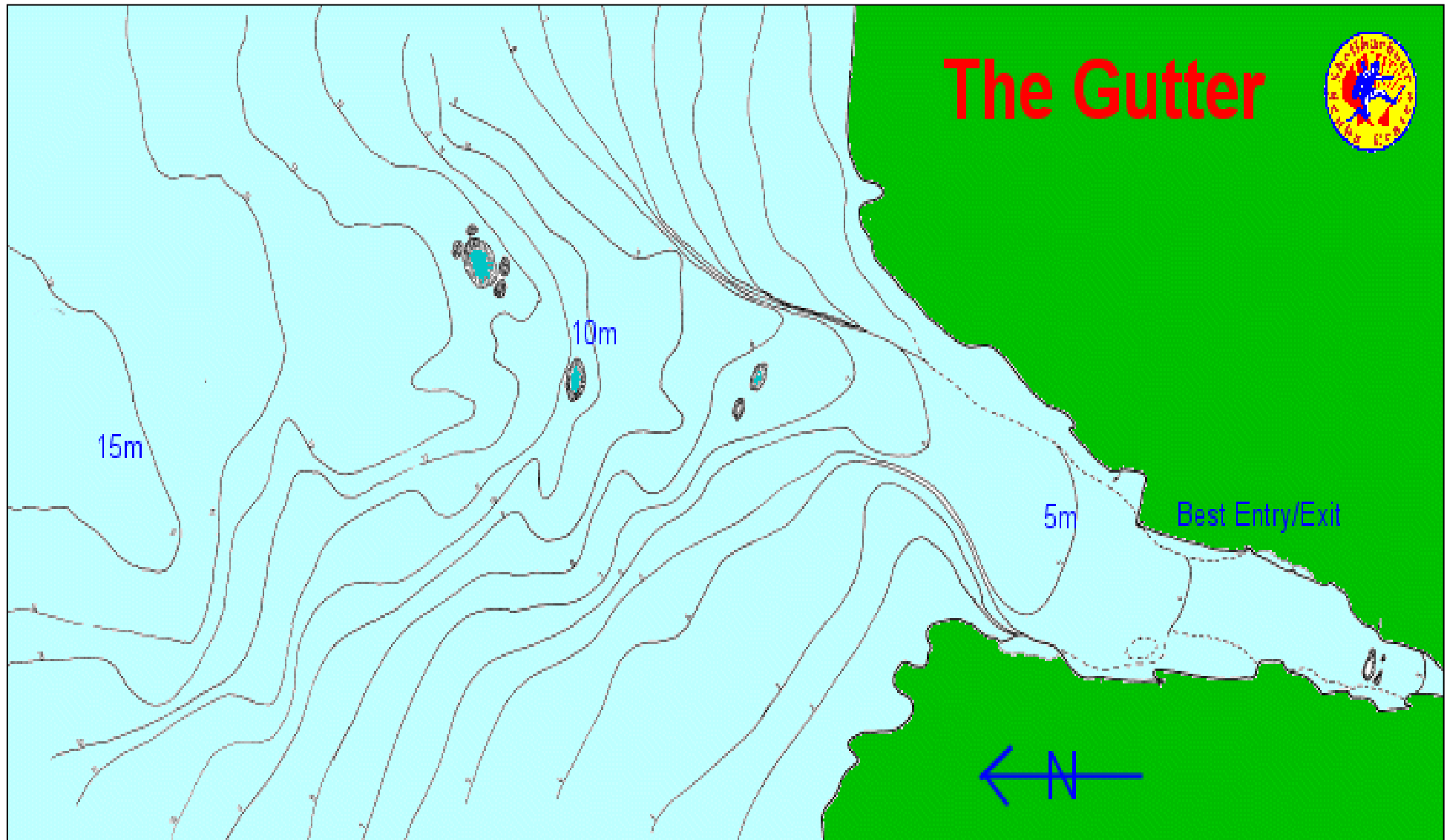
Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk score *	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
2	Disorientation during dive	M	<ul style="list-style-type: none"> - Study the dive site mud map ('The Gutter' mud map available - attached). - Stay with your dive buddy (or with your group). - Dive with someone experienced at diving the location. - Use compass in order to orientate yourself on your approach and return to shore. - Use landmarks <p>Gravel Loader</p> <p>Follow the pylons along the loader on the eastern edge of the dive.</p> <p>The Gutter</p> <p>Follow the rock wall on western or eastern side of gutter.</p>		As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk score *	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
3	Bite/sting from marine animal	M	<ul style="list-style-type: none"> -Take due care. - Wear gloves when sampling. - Do not poke or prod unknown or dangerous animals. - Be aware of the species likely to be encountered within the site area (especially poisonous species). - Do not put your hand inside dark holes or crevices. 		As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk score *	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
4	Dehydration/thermal exposure to extremes.	M	<ul style="list-style-type: none"> - Do not dive in high winds (e.g. > 20knots). - Inform staff at the university of location and estimated return date and time. - Always dive by the dive plan and proposal. - Ensure that the dive team carry a mobile phone in vehicle for emergencies. - Adequate exposure protection to be worn by all divers (i.e. wetsuit 3-7mm thickness, hood etc.) - Take oxygen resuscitation equipment on all scuba/snorkelling trips and ensure people are trained in using it. 	<ul style="list-style-type: none"> - Ensure warm, dry clothes are available to change into after diving. 	As above			
5	Entrapment	M	<ul style="list-style-type: none"> - Study the dive site mud map (The Gutter only attached). - Stay with your dive buddy (or group). - Ensure your octopus regulator and gauges are clipped into your BCD to avoid drag and snagging. 	<ul style="list-style-type: none"> - Always carry a diving knife. - Do not enter narrow caves/crevices where risk of entrapment is high. 	As above			

Hazard Identification		Risk Assessment		Risk Control			Review	
No.	What harm can happen to people or equipment	Risk score *	List any Control Measures already implemented	Describe what can be done to reduce the harm	Whom Responsible	When By	Are the Controls Effective?	Date Finalised
6	Nitrogen Narcosis	L	<ul style="list-style-type: none"> - These two dives reach a maximum depth of: Gutter – 20 metres (66 feet); Loader – 10 metres (33 feet), Therefore nitrogen narcosis is unlikely (usually occurring at >100 feet depth). 		As Above			
7	Decompression Sickness	L	<ul style="list-style-type: none"> - Dive by the dive plan and proposal. - Keep bottom time to within no decompression limits. - The rate of ascent should be a maximum of 15 metres +/- 3 metres per minute. - Always do a 3-5 min safety stop at 5 metres depth at the end of your dive. - Stay above the recreational depth limit of 25 metres. - If repetitive dives ensure that sufficient surface interval to avoid decompression sickness. 		As Above			

APPENDIX P – THE GUTTER – DIVING MAP



APPENDIX Q – BUSHRANGERS BAY – DIVING MAP

