University of California, Berkeley
Diving Safety Manual

1996 Diving Control Board

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Section One

ORGANIZATION

1.10 LEGAL FRAMEWORK
Scientific diving is exempt from the OSHA Commercial Diving Standard provided that specific requirements are met.

The following is from the State of California Code of Regulations (CCR) Title 8, Article 152, General Diving Industry Safety Orders, giving the specific exemption and necessary requirements.

Scientific diving operations under the direction and control of a diving program containing at least the following elements (are exempt):

Diving Safety Manual which includes at a minimum: procedures covering all diving operations specific to the program; procedures for emergency care, including recompression and evacuation; and criteria for diver training and permitting.

Diving Control (safety) Board, with the majority of its members being active divers, which shall at a minimum have the authority to: approve and monitor diving projects; review and revise the diving safety manual; assure compliance with the manual; permit the depths to which a diver has been trained; take disciplinary action for unsafe practices; and assure adherence to the buddy system (see 2.14).

This Manual complies with Title 8, Article 152, and the American Academy of Underwater Sciences (AAUS) Standards for Scientific Diving and Permitting and Operations of Scientific Diving Programs. The AAUS document represents the minimal safety standards for scientific diving at the present state-of-the-art. This manual is intended to meet or exceed those standards.

1.11 CAMPUS POLICY
It is the policy of the University of California, Berkeley, that all diving under University auspices be carried out in accordance with the provisions of the University Diving Safety Manual.

1.12 CAMPUS ORGANIZATION
The campus Diving Program consists of the Diving Control Board (DCB), the Diving (Safety) Officer (DSO), and the Division of Diving Control (DDC). The DDC is the administrative focus of the Diving Program.

1.20 PURPOSE

1.21 THE DIVING SAFETY PROGRAM
The purpose of the Diving Safety Program is to ensure that all diving under the auspices of the University of California, Berkeley, is conducted in a manner that will minimize the chances of accidental injury and illness. Fulfillment of this purpose shall be consistent with maximum possible safety.
1.22 THE DIVING SAFETY MANUAL
The Diving Safety Manual shall define the requirements, procedures, and protocols which establish and govern the University of California, Berkeley, Diving Program. The Diving Program encompasses all compressed gas diving activities carried out under the auspices of the University of California Berkeley. It is recognized that compressed gas diving has inherent risks. To minimize those hazards, all University regulations and procedures contained herein shall be carried forward to the letter and the spirit of safety in diving operations.

1.30 SCOPE

1.31 DIVING DEFINED
All diving, for the purposes of this manual, is defined as compressed gas diving performed by individuals necessary to or part of scientific research, training, educational endeavors, or other activities conducted under the auspices of the University of California Berkeley.

1.32 UNIVERSITY AUSPICES DEFINED
University auspices shall include:

A. Equipment
   Anyone who uses University equipment for compressed gas diving;

B. Locations
   Anyone who conducts compressed gas diving activities from locations owned or operated by the University of California Berkeley.

C. Relationships
   Any University employee(s) acting within the scope of their employment, University student(s) while participating in University affiliated activities, and anyone engaged in University authorized research, regardless of the ownership of the equipment used.

   If any one of these conditions apply the diving must follow the provisions of the Diving Safety Manual.

1.40 RELEASES
All students, employees and persons diving under University auspices shall execute a release holding The Regents harmless from any claims which might arise in connection with scuba diving or other diving modes.

See Appendix A.
1.50 THE DIVING CONTROL BOARD

1.51 APPOINTMENT AND COMPOSITION
The Diving Control Board is an Administrative Committee appointed by the Vice Chancellor for Research on behalf of the Chancellor. Membership shall not exceed 12. The Board shall consist of at least five Senate members from at least two different units, a member whose area or field is not directly affected by the decisions of the Board, a physician and at least one graduate and/or undergraduate each of whom is an active UC Berkeley permitted diver. The Diving Safety Officer and the Director of Environment, Health and Safety (EH&S) are ex-officio members of the Board. A majority of the Board must be active scientific divers as mandated by California: CCR Title 8 Article 152 §6050-6063 and the Federal:29CFR §1910.401-1910.441.

Members serve a five year term and may be appointed for another term. The Vice Chancellor for Research receives nominations by the Chair in consultation with the Board and can solicit nominations from other sources as appropriate. The Chair shall be a member of the Academic Senate, preferably from the current or past membership. The Chair serves a two-year term and may be re-appointed by the Vice Chancellor for Research. The Vice Chancellor receives nominations for the Chair from the current Chair, the EH&S Policy Committee, Board members and from other sources as appropriate. The Vice Chancellor appoints the Chair upon consultation with the EH&S Policy Committee CO-Chairs.

1.52 AUTHORITY AND RESPONSIBILITY
The Diving Control Board has the authority granted by California: CCR Title 8 Article 152 §6050-6063 to:

A. Approve and monitor diving projects and the dive project manager;
B. Review and revise the Diving Safety Manual;
C. Assure compliance with the Manual;
D. Certify the depths to which a diver has been trained;
E. Take disciplinary action for unsafe diving practices;
F. Assure adherence to the buddy system for scuba diving.
G. Issue, reissue or revoke diving permits;
H. Recommend changes in policy and amendments to manual as the need arises.
I. Establish and/or approve training programs through which the applicants for permitting can satisfy the requirements of the Diving Safety Manual;
J. Suspend diving programs which it considers to be unsafe, or otherwise violate the Diving Safety Manual.
K. Establish criteria for equipment selection and use.
L. Recommend new equipment or techniques

M. Establish and/or approve facilities for the inspection and maintenance of diving and associated equipment;

N. Ensure that air station(s) owned or managed by the University meet air quality standards as described in Section 6;

O. Periodically review the Diving Safety Officer's performance and program;

P. Sit as a board of investigation to inquire into the nature and cause of diving accidents or violations of the diving safety manual.

1.60 THE DIVING (SAFETY) OFFICER

1.61 APPOINTMENT AND QUALIFICATION
The Diving (Safety) Officer (DSO) is appointed by the Vice Chancellor for Research on behalf of the Chancellor, with the advice and counsel of the Diving Control Board (DCB). The DSO shall be a permitted scientific diver and a certified scuba instructor or have the equivalent diving supervisory experience.

1.62 AUTHORITY AND RESPONSIBILITIES
A. Shall conduct the scientific diving program and report through the DCB to the responsible administrative officer or his/her designee. The operational authority for the program rests with the DSO and shall include:
   1. the conduct of training and permitting
   2. the approval of dive plans
   3. the maintenance of diving records
   4. ensuring the program’s compliance with the Diving Safety Manual and all relevant regulations
   5. recommending changes in the Diving Safety Manual to promote safe diving practice.

B. May permit portions of the diving program to be carried out by a qualified delegate, although the DSO may not delegate responsibility for the safe conduct of the Diving Safety Program.

C. Shall be guided in the performance of the required duties by the advice of the DCB, but operational responsibility for the conduct of the diving program will be retained by the DSO.

D. Shall suspend diving operations which he/she considers to be unsafe or unwise and immediately inform the DCB.

E. Shall evaluate equipment maintenance programs and recommend, for DCB approval, organizations and/or individuals qualified to inspect and maintain diving equipment.

G. Shall recommend equipment and disapprove unsafe equipment for use by divers.

H. Shall conduct general surveillance of the diving program and diving projects and recommend to the DCB changes in or additions to policy, standards and regulations to promote safety in diving.
1.70 PROJECT DIVE MANAGER

1.71 RESPONSIBILITY
The manager shall be personally responsible for assuring that diving activities in the projects he/she directs are conducted in accordance with the requirements of this Manual. He/she shall also be considered the Lead Diver (see section 2.21) unless he/she designates someone to that position and notifies the Diving Safety Officer of this designation.

1.72 CERTIFIED DIVERS
The manager shall personally determine that each person whom he/she permits or assigns to dive on projects under his/her direction possess a valid diver's permit issued by the Diving Control Board. He/she shall submit a list of divers who will participate and their permit numbers to the Diving Safety Officer before the diving project begins.
2.10 GENERAL REQUIREMENTS

2.11 PERMITTING REQUIRED
No person shall engage in diving unless he/she holds a valid permit issued by the Diving Control Board pursuant to the provisions of this Manual or is engaged in training as prescribed by this Manual.

2.12 RECREATIONAL DIVING
Permitted divers engaging in research diving activities may not engage in recreational dives while under the auspices of UC Berkeley. If recreational dives are conducted during a research program, the diver must have a minimum surface interval of 24 hours after a single recreational dive and 48 hours after multiple recreational dives before engaging in research diving activities. Recreational diving activities may count towards the diving activity of a permitted diver at the discretion of the Diving Safety Officer. Recreational dives should be conducted in accordance with national safe diving guidelines.

2.13 DEPTH LIMITATIONS
A permitted diver shall not exceed his/her depth permit unless accompanied by a diver permitted to at least the next greater depth. Under these circumstances, the diver may not exceed his/her depth limit by more than one depth category. Diving is not permitted beyond a depth of 130 feet without following special guidelines (see section 2.30).

2.14 DIVING PROJECT APPROVAL
All diving projects shall be approved by the Diving Control Board prior to the start of diving activities. Any modifications to approved project dive plan require written notification and approval of the DSO. The Project Dive Manager shall submit a project dive plan that includes the following.

A. Diving mode.

B. Breathing gas supply.

C. Thermal protection.

D. Divers qualifications, and the type of permit held by each diver.

E. Emergency plan (see Appendix B) with the following information:
   1. name, telephone number and relationship of person to be contacted for each diver in the event of an emergency.
   2. nearest operational recompression chamber
   3. nearest accessible hospital
   4. available means of transport

F. Approximate number of proposed dives

G. Location(s) of proposed dives

H. Estimated depth(s) and bottom times(s) anticipated.
I. Decompression status and repetitive dive plans, if required

J. Proposed work, equipment, and boats to be employed

K. Any hazardous conditions anticipated.

L. Any specialized diving techniques. (Section 2.30)

M. Deviations from manual requirements require advance approval from DCB. Alternative measures must be approved by the DCB.

N. Projected dates of activity

2.15 SOLO DIVING PROHIBITED
All diving conducted shall be planned and executed in such a manner as to ensure that every diver maintains constant, effective communication with at least one other comparably equipped permitted scientific diver in the water. This buddy system is based upon mutual assistance, especially in the case of an emergency.

2.16 CONSUMPTION OF ALCOHOL PROHIBITED
Permitted divers engaging in research diving activities should avoid heavy drinking and refrain from drinking any alcoholic beverages for a minimum of 8 hours prior to diving.

2.17 DEVIATIONS FROM REQUIREMENTS IN EMERGENCIES
Any diver may deviate from the requirements of this manual to the extent necessary to prevent or minimize a situation which is likely to cause death, serious physical harm, or major environmental damage. A written report of such deviations must be promptly submitted to the Diving Safety Officer explaining the circumstances and justifications for action.

2.18 EMERGENCY/ACCIDENT REPORTING
Diving Emergency Management procedures shall be developed for each dive location and shall consider diver evacuation and medical treatment.
See Appendix B.

In the event of a diving emergency notify the DSO or designee, immediately. Complete and submit appropriate Diving Incident or Accident form to the DCB. All diving deaths or accidents requiring recompression treatment shall be reported to AAUS.
See Appendix C.

2.20 GENERAL DIVING PROCEDURES
2.21 COLD AND ARDUOUS DIVING
It is the responsibility of the diver to ensure proper use of the dive tables or a dive computer, and to determine his/her thermal and fatigue status during a dive. The proper procedure for cold or arduous dives with regards to dive table use is to use the next greater bottom time when calculating end of dive letter group. For cold and arduous dives, use the next greater time and depth for letter group determination.
2.22 LEAD DIVER
The lead diver shall be a permitted scientific diver. For each dive one individual shall be designated as the lead diver. S/he shall be at the dive location during the diving operation. The lead diver shall be responsible for preparing a dive plan consistent with approved project plan (section 2.13); coordinating with other known activities in the vicinity which are likely to interfere with diving operations; briefing the dive team members on the dive plan, daily diving conditions and the fitness of divers.

2.23 ON SITE DIVE PLANNING See Appendix D
The daily dive plan shall be planned around the competency of the least experienced diver and include considerations of the following:

A. Diving locations
B. Surface and underwater conditions and hazards.
C. Diving equipment.
D. Dive team assignments.
E. Residual inert gas status of dive team members.
F. Emergency procedures.

2.24 SAFETY CHECKS
A. PRE-DIVE
Each scientific diver shall conduct a functional check of his or her diving, research and support equipment in the presence of the diving buddy or tender.

B. POST-DIVE
After the completion of a dive, each diver shall report any physical problems, symptoms of any type of barotrauma, equipment malfunctions, omitted decompression or unplanned decompression to the lead diver or Diving Safety Officer.

C. FLYING AFTER DIVING
The minimum wait before flying after diving is 24 hours. Extended surface intervals shall be required in cases where an exceptional number of dives or decompression diving occurs on the last diving day.

D. ALTITUDE CHANGE AFTER DIVING
Divers whose surface transportation will take them to altitude following an ocean or altitude dive must consider the effects of the elevation and plan a surface interval sufficient enough to avoid decompression injuries.

E. RESPONSIBILITY
The decision to dive is that of the individual diver. A diver may refuse to dive, without fear of penalty, whenever he/she feels it is unsafe for him/her to make the dive.
F. SAFETY
The ultimate responsibility for safety rests with the individual diver. It is the diver's responsibility and duty to refuse to dive if in his/her judgment, conditions are unsafe or unfavorable, or if s/he would be violating the regulations of this manual.

2.25 TERMINATION OF A DIVE
A. RESPONSIBILITY
It is the responsibility of the individual diver to terminate the dive, without fear of penalty, whenever s/he feels it is unsafe to continue the dive.

B. SAFETY
The dive shall be terminated while there is still sufficient cylinder pressure to permit the diver to safely reach the surface, including any decompression time, or to safely reach an additional air source at a planned decompression station.

2.26 USE OF REQUIRED EQUIPMENT
A. DIVER'S FLAG
The appropriate diver's flag shall be prominently displayed whenever diving is conducted from a boat or pier or under any circumstances in which water traffic is probable.

B. FLOTATION AND BUOYANCY CONTROL DEVICE
All divers shall have adequate flotation and buoyancy control gear on every dive. This device must provide positive flotation at the surface and be capable of adjusting buoyancy while underwater.
C. TIMING DEVICES, DEPTH GAUGES AND PRESSURE GAUGES
   All members of the diving team must have an underwater time-keeping
device, an approved depth indicator, and a submersible tank pressure
gauge.

D. DIVE TABLES AND DIVE COMPUTERS
   A set of appropriate diving tables approved by the DCB must be available
   at the dive location. Dive computer models and use must be approved by
   the DCB. See Appendix L.

E. ALTERNATE AIR SOURCES
   An octopus or alternate air source is required during all training and
   research dives. A redundant air source approved by the Diving Control
   Board (or approved alternative) is required (minimum of one per buddy
   team) on all dives below 100 feet.

F. EMERGENCY SUPPLIES
   A first aid kit, oxygen and a person trained in its use shall be available at
   the dive location.

2.27 DIVING LOG
   Each permitted diver shall log every dive made under University of California
   Berkeley auspices. Divers are encouraged to submit logs of all diving activity,
   including recreational dives. Recreational diving activities may count towards the
   diving activity of a permitted diver at the discretion of the Diving Safety Officer.
   Recreational dives should be conducted in accordance with national safe diving
   guidelines. Log sheets shall be submitted monthly to the Division of Diving
   Control.

   See Appendix E.
2.30 SPECIALIZED DIVING TECHNIQUES, PROCEDURES, AND MODES
Any diving techniques, procedures or modes including but not limited to items (A-J) shall require prior approval by the Diving Control Board and the Diving Safety Officer to ensure that proper training and appropriate equipment be available.

A. Saturation diving

B. Surface supplied air including hookah

C. Mixed-gas diving

D. Closed circuit

E. Enclosed and confined spaces

F. Decompression diving

G. Polar and ice diving

H. Polluted water

I. Altitude diving

J. Blue-water diving

K. Dives deeper than 130 fsw
Section Three
PERMITTING

3.10 PERMIT TYPES

A. SCIENTIFIC DIVER PERMIT:
This permit indicates a diver has completed all training to be a scientific diver and is permitted to dive. The permit is valid only while it is current and used for its intended purpose.

B. DIVER-IN-TRAINING PERMIT:
This permit signifies that a diver has completed a minimum of 40 hours of training with at least 5 ocean or open water dives, and possess a nationally recognized diving certificate or equivilant. Divers with this permit will be required to complete further training in scientific diving before receiving a scientific diver permit.

C. TEMPORARY DIVER PERMIT.
This permit is issued following a demonstration of the required proficiency in diving, and/or completed reciprocity paperwork. It is valid only for a specified time, as determined by the Diving Safety Officer. The Diving Safety Officer shall report all such issuance to the DCB in writing.

3.20 REQUIREMENTS FOR PERMITTING

3.21 SCIENTIFIC DIVER PERMIT

A. ELIGIBILITY
Only persons intending to dive under University auspices are eligible for Scientific Diver permitting.

B. APPLICATION
Application for diver permitting shall be made to the Diving Control Board on the form prescribed. See Appendix F

C. MEDICAL EXAMINATION
Each applicant for diver permitting shall submit a statement by a physician, based on medical examination, attesting to the applicant's physical fitness for diving with SCUBA. This examination shall follow the format prescribed by the Diving Control Board. See Appendix G

D. EMERGENCY CARE TRAINING
   I) CPR must be current at all times
   II) First aid training evidence
   III) Emergency Oxygen training evidence

E. TRAINING
All applicants shall have successfully completed training and experience, beyond Diver in Training permit, approved by the Diving Control Board. Minimum cumulative time beyond DIT for theoretical aspects and practical training should equal 100 hours.

F. EXAMINATION
All applicants shall pass a written examination as a condition of permitting. Written exam may include the following topics: diving physics, physiology,
medicine, fitness, rescue, first aid, dive tables, the diving environment (physical and biological), research methods, and University regulations.

G. WAIVER
All divers must sign a UC Berkeley waiver. See Appendix A

3.22 DIVER IN TRAINING
This permit signifies that a diver has met all the requirements for scientific diver permitting of section 3.21 except for section 3.21 D. Training. Said diver must have completed a minimum of 40 hours of scientific diver training with at least 5 ocean dives. Divers with this permit are expected to complete further training towards the scientific diving permit.

3.23 TEMPORARY DIVING PERMIT
The Diving Safety Officer may waive the requirements of paragraphs 3.21, with the exception of 3.21C, if the person in question has a demonstrated proficiency in diving and can contribute measurably to a planned dive. The person in question may be asked to make a pool and or ocean evaluation dive before being issued the temporary permit.

A statement of the temporary diver’s qualifications shall be submitted to the Diving Safety Officer as a part of the dive plan. Temporary permission to dive shall be restricted to the planned diving operation and is valid only for the time period indicated. This permit is not to be construed as a mechanism to circumvent existing standards set forth in this manual.

3.24 COMPLETION OF REQUIREMENTS
Completion of the permitting requirements does not automatically result in permission to dive under University auspices. The diver must satisfy a majority of the Diving Control Board members and the Diving Safety Officer, that s/he is sufficiently skilled, and both physically and mentally proficient to be permitted. This proficiency and skill will be attested to by the signatures of the Board Chairperson and the Diving Safety Officer on the Diving Permit.

3.25 RECIPROCITY AND WAIVER OF REQUIREMENTS
A. WAIVER
If an applicant for permitting can show evidence of previous qualifying experience or training, the Diving Control Board may grant a waiver for specific requirements of training and experience. See Appendix H for waiver conditions.

B. RECIPROCITY AND VISITING SCIENTIFIC DIVER
See Appendix J for AAUS Diving Reciprocity Authorization form

1. Two or more Scientific Diving programs engaged jointly in diving activities, or engaged jointly in the use of diving resources, shall designate one of the participating Diving Control Boards to govern the joint dive project.

2. A visiting scientific diver shall apply for permission to dive under the auspices of the University by providing a completed letter of reciprocity. The truth and accuracy of the information contained herein shall be attested to by the Chairperson of the home Diving Control Board or the home Diving Safety Officer.
3. If, in the opinion of the Diving Safety Officer, the environment and/or equipment will be significantly different than the norm for a visiting scientific diver, the diver may be asked to demonstrate his/her knowledge and skills for the planned diving.

4. If the visiting scientific diver is denied permission to dive, the DCB shall promptly submit to the diver and his/her DCB a written explanation of all reasons for the denial.

3.30 DEPTH PERMITTING
The scientific diving permit will authorize the holder to dive to the depth indicated on the permit. (see paragraph 2.12). All training dives must be pre-approved by the Diving Safety Officer.

3.31 DIVER IN TRAINING (30 Feet)
See section 3.10B and 3.22. An additional 7 dives (for a total of 12) under supervision are required before diver is eligible to begin training towards 60 foot certification.

3.32 SCIENTIFIC DIVER: PERMIT TO 60 FOOT DEPTH
A diver holding a DIT permit may be permitted to a depth of 60 feet after successfully completing, under supervision of another diver approved by the Diving Safety Officer, and permitted to at least 60 feet, 12 logged training dives to depths between 40 and 60 feet, for a minimum total bottom time of 4 hours. Additional training may be required (see section 3.21).

3.33 PERMIT TO 100, and 130 FOOT DEPTHS
A diver holding a 60 foot permit may be permitted to depths of 100, and 130 feet respectively by successfully completing, under supervision of another diver permitted to at least the next greater depth, and approved by the DSO, at least 4 dives between 60 and 100 feet, and/or 100 and 130 feet. The diver must show the ability to safely reach the surface from the depth of permitting in the event of a failure of the primary gas source.

3.40 MAINTENANCE OF PERMIT

3.41 TERM OF PERMIT
All diving permits shall remain current so long as 5 requirements are maintained: diving activity, medical exam, CPR training, equipment maintenance, and University affiliation (or volunteer status).

A. DIVING ACTIVITY
During any 12 month period, each permitted diver must log one dive to the depth of permitting every six months with a minimum of 12 dives annually. Failure to meet these requirements may be cause for the Diving Safety Officer to suspend and/or the Diving Control Board to revoke or restrict a permit.
B. MEDICAL EXAMINATION
   All permitted divers shall pass a medical examination at intervals not exceeding three years up to age 40 and two years after age 40. After each illness or injury, permitted divers shall submit to medical interview and/or medical examination before resuming diving activities. See Appendix G

C. CPR TRAINING
   CPR training must be kept current and renewed as prescribed by a training agency.

D. EQUIPMENT
   On an annual basis, the regulator, depth gauge, backpack, cylinders, buoyancy compensator devices and pressure gauges shall be inspected by the DSO or DSO-approved designee and serviced as needed.

E. AFFILIATION
   Divers must retain a University affiliation as defined by section 1.32C, or be on current volunteer status.

3.50 REVOCATION OF PERMIT
   A diving permit may be suspended by the Diving Safety Officer then revoked or restricted for cause by a majority of the Diving Control Board. Violation of any regulation in this Manual may be considered cause. A diver whose permit is in jeopardy shall be given an opportunity to present his/her case to the Board, who shall be in attendance as a body to consider the case presented. Restrictions or revocations may be appealed according to procedures in Appendix K.

3.60 RE-PERMITTING
   If a diver's permit expires s/he may be re-permitted after complying with such conditions as the Diving Control Board may impose. Such conditions shall be agreed to by a majority of the Board. The diver shall be given the opportunity to present his/her case to the Board before conditions for re-permitting are stipulated.

Section Four
TRAINING

4.10 PRE-TRAINING

4.11 MEDICAL EXAMINATION
   The applicant for training shall submit completed medical forms as prescribed in Appendix G

4.12 SWIMMING TEST
   The applicant for training shall successfully perform the following tests in the pool in the presence of a member of the Board or an examiner approved by the Board:

   A. Swim under water without fins for a distance of 75 feet without surfacing.

   B. Swim under water without fins for a distance of 125 feet, surfacing not more than four times.
C. Swim 1,200 feet in less than 10 minutes without fins.

D. Surface dive without fins to a depth of 10 feet and recover a swimmer and tow him/her 75 feet at the surface.

E. Without fins, carry a swimmer 75 feet at the surface.

F. Without fins, tread water continuously for a period of 10 minutes.

### 4.20 SCUBA TRAINING

#### 4.21 POOL TRAINING

At the completion of pool training, the trainee must satisfy a member of the Board or an examiner approved by the DCB of his/her ability to perform at minimum the following in a swimming pool:

1. Demonstrate understanding of underwater signs and signals

2. Demonstrate proper entry and exit procedures.

3. Demonstrate use of Buoyancy Compensator equipment.

4. Remove and replace weightbelt.

5. Clear face mask and breathing apparatus.

6. Demonstrate air sharing, including both buddy breathing, and the use of alternate air source, as both donor and recipient, with and without a face mask.

7. In-water demonstrate rescue, transport, and simulated artificial respiration of a “victim” by approved method.

8. Enter water holding all equipment, SCUBA, mask, fins, and weightbelt, and replace it after descending to bottom (Bailout).

### 4.22 OCEAN TRAINING

The trainee must satisfy a diver approved by the Board of his/her ability to perform the following in the ocean:

A. Demonstrate proficiency in air sharing, including both buddy breathing and the use of alternate air source, as both donor and recipient.

B. Enter and leave surf wearing SCUBA.

C. Kick on the surface 400 yards while wearing scuba gear, but not breathing from the scuba unit.

D. Demonstrate, where appropriate, the ability to maneuver efficiently in the environment, at and below the surface.

E. Complete a simulated emergency swimming ascent.
F. Demonstrate ability to achieve and maintain neutral buoyancy while submerged.

G. Demonstrate techniques of self-rescue and buddy rescue.

H. Navigate underwater

I. Plan and execute a dive

J. Must demonstrate familiarity with equipment in the water.

K. Successfully perform a minimum of 12 open water dives for a minimum total time of 6 hours at a depth not to exceed 60 feet, unless accompanied or supervised by the DSO or qualified designee. No more than 3 dives shall be made in any one day.

4.23 WRITTEN EXAMINATION
Before completing training, the trainee must pass a written examination. Written exam may include the following topics: diving physics, physiology, medicine, fitness, rescue, first aid, dive tables, the diving environment (physical and biological), research methods, and University regulations.

4.30 ADDITIONAL TRAINING
Additional training will be required when necessary for a given research project or program.

Section Five
DIVING EQUIPMENT

5.10 GENERAL POLICY
A. Standards
   All equipment shall meet standards as determined by the Diving Safety Officer and the Diving Control Board.

B. Diver Responsibility
   All equipment shall be regularly examined by the person using it.

C. Training in Equipment Use
   The diver shall be adequately trained to use all equipment.

D. Routine Inspection Required to Maintain Permit
   Equipment shall be inspected by the DSO or designate according to section 3.41.

5.20 EQUIPMENT INSPECTION REQUIREMENTS
Equipment that is subjected to extreme conditions or very frequent use will require more frequent testing and maintenance than listed below.

REGULATORS
Scuba regulators shall be inspected and tested prior to first use and every twelve months thereafter.
CYLINDERS AND VALVES
A. Scuba cylinders shall be designed, constructed, and maintained in accordance with the applicable provisions of the Unfired Pressure Vessel Safety Orders.

B. Scuba cylinders must be hydrostatically tested in accordance with Department of Transportation standards (every 5 years).

C. Scuba cylinders must have an internal inspection at intervals not to exceed twelve months.

D. Scuba cylinder valves shall be functionally tested at intervals not to exceed twelve months.

PRESSURE GAUGES
Pressure gauges shall be inspected and tested before first use and every twelve months thereafter. Inaccurate gauges shall not be used.

BUOYANCY CONTROL DEVICES AND DRYSUITS
These devices shall be functionally inspected and tested at intervals not to exceed twelve months.

BACKPACK
Cylinder backpacks shall be inspected and tested prior to first use and every twelve months thereafter.

OTHER DIVING EQUIPMENT
All other equipment e.g. timing devices, depth gauges, and free-diving equipment shall be in good working order.

5.30 UNDERWATER POWER TOOLS
Hand held underwater power tools. Electrical tools and equipment used underwater shall be specifically approved for this purpose. Electrical tools and equipment supplied with power from the surface shall be de-energized before being placed into or retrieved from the water. Hand held power tools shall not be supplied with power from the dive location until requested by the diver.

5.40 RECORD KEEPING
Each equipment modification, repair, test, calibration, or maintenance service shall be logged. Division of Diving Control records shall include the date and nature of work performed, serial number of the item, and the name of the person performing the work.

5.50 UNIVERSITY AIR COMPRESSORS
A. Low pressure compressors used to supply air to the diver if equipped with a volume tank shall have a check valve on the inlet side, a relief valve, and a drain valve.

B. Compressed air systems over 500 psig shall have slow-opening shut-off valves.
C. All air compressor intakes shall be located away from areas containing exhaust or other contaminants.

Section Six
BREATHING AIR

6.10 AIR QUALITY STANDARDS

Breathing air for Scuba shall meet the following specifications as set forth by the Compressed Gas Association (CGA Pamphlet G-7.1) and referenced in OSHA 29 CFR 1910.134.

<table>
<thead>
<tr>
<th>Component</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGA Grade E</td>
<td></td>
</tr>
<tr>
<td>Oxygen</td>
<td>20-22%/v</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>10 PPM/v</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>500 PPM/v</td>
</tr>
<tr>
<td>Condensed Hydrocarbons</td>
<td>5 mg/m3</td>
</tr>
<tr>
<td>Water Vapor</td>
<td>NS</td>
</tr>
<tr>
<td>Objectionable Odors</td>
<td>None</td>
</tr>
</tbody>
</table>

It shall be the responsibility of the individual diver to assure that the air he/she uses is from an OSHA approved source or meets the specifications above.
Section Seven:
NITROX USE

7.1 NITROX GUIDELINES

7.1.1 ELIGIBILITY

Only a certified scientific diver or scientific diver-in-training (DIT), under the auspices of UC Berkeley, is eligible to engage in nitrox (also known as enriched air or EANx) dive training and/or operations.

7.1.2 REQUIREMENTS FOR SCIENTIFIC NITROX DIVER

The individual must hold an active scientific diver or DIT permit including current medical examination, emergency care training, and demonstrate to the DSO and DCB an acceptable level of proficiency in necessary skills and theory relevant to nitrox diving. Prospective nitrox divers shall demonstrate open-water skill and knowledge adequate for conditions where dive operations will take place.

7.1.3 EXAMINATIONS

Each prospective nitrox diver shall demonstrate additional theoretical and practical proficiency beyond scientific diver air certification level in examinations covering:

- Written examinations covering the information presented in the classroom session(s)
- Practical examinations covering the information presented in the practical training session(s)
- Two open water dives with the DSO or designee to demonstrate the application of theoretical and practical skills.

7.1.4 REQUIREMENTS TO USE NITROX

7.1.41 Application

The applicant will provide to the DSO for review by the DCB:

- A completed project application form noting the use of nitrox
- Proof of scientific diver, or diver-in-training status
- Proof of successful completion of a nitrox user course, both classroom and open-water sections. (See section 7.3)

7.1.42 Authorization

Submission of documents does not automatically result in nitrox use authorization. The candidate must convince the DSO and members of the DCB that the diver is sufficiently skilled and proficient to be certified. Proficiency in these skills will be acknowledged by the signature of the DSO on a certification or project application form. After completion of nitrox training and evaluation, nitrox diving certification may be denied to any applicant who does not demonstrate, to the satisfaction of the DSO and DCB, the appropriate judgment and/or proficiency to ensure the safety of the diver and dive partner.
7.1.43 Waiver of Requirements
The DSO and the DCB may grant a waiver for the specific requirements of experience and training for applicant certification if evidence of qualifying knowledge and experience in enriched air diving can be demonstrated.

7.1.44 Temporary Certification
The requirements of Section 7.1.3 may be waived by the DSO and one member of the DCB if all criteria set forth in Section 3.21 are met, plus demonstrated proficiency in enriched air diving.

7.1.5 CERTIFICATION MAINTENANCE
In addition to standards set forth in section 3.4 at least one nitrox dive must be logged every six months. Failure to meet this criterion may be cause for revocation or restriction of nitrox use authorization.

7.2 NITROX DIVING REGULATIONS
7.2.1 DIVE PERSONNEL REQUIREMENTS
7.2.1.1 Nitrox Diver-In-Training:
A Diver-In-Training, who has completed the requirements of section 3.2.1.1-4, and 3.2.1.7 of this manual may be authorized by the DSO to use nitrox under the direct supervision of a scientific diver who also holds nitrox authorization. Dive depths shall be restricted to those specified on the diver’s permit.

7.2.1.2 Scientific Diver:
A Scientific Diver who has completed all of the requirements detailed in section 3.2.1 of this manual may be authorized by the DSO to use nitrox. Depth authorization to use nitrox shall be the same as those specified on the diver’s permit. (See section 3.3)

7.2.1.3 Lead Diver:
The lead diver must be authorized to use nitrox on any dive during which nitrox will be used by any team member, and hold appropriate authorizations required for the dive. (See section 2.22) Nitrox use shall be detailed in the dive plan.

In addition to the responsibilities listed in section 2.22, the lead diver shall:

7.2.1.31 As part of the dive planning process, verify that all divers using nitrox on a dive are properly qualified and authorized

7.2.1.32 As part of the pre-dive procedures, confirm with each diver the nitrox mixture the diver is using, and establish dive team maximum operating depth (MOD) and time limits, according to the shortest time limit or shallowest depth limit among the team members

7.2.1.33 The lead diver shall also reduce the maximum allowable PO2 exposure limit for the dive team if on-site conditions so indicate. (See section
7.2.2 DIVE PARAMETERS

7.2.2.1 Dive Limitations:

7.2.2.1.1 Planned decompression dives must be approved by the DCB.

If using the equivalent air depth (EAD) method, the maximum depth of a dive shall be based on the partial pressure of the oxygen for the specific breathing mixture to be used. The oxygen partial pressure experienced at depth shall not exceed 1.45 ATA.

7.2.2.1.2 If the dive is anticipated to be cold and/or arduous the maximum partial pressure of oxygen shall not exceed 1.4 ATA oxygen.

7.2.2.2 Bottom Time Limitations:

7.2.2.2.1 Maximum bottom time shall be based on the depth of the dive and the breathing mixture being used.

7.2.2.2.2 Bottom time of dives shall not exceed the NOAA maximum allowable “Single Exposure Limit” for a given partial pressure of oxygen. (See section 7.2.3.2)

7.2.2.3 Decompression Models and Gasses:

7.2.2.3.1 Decompression models must be approved by the DCB.

7.2.2.3.2 Nitrox compatible computers may be used with approval from the DSO. (See section 7.2.2.4)

7.2.2.3.3 It is the responsibility of each individual diver to determine their own decompression obligation, EAD, MOD and CNS limit for the oxygen content of the cylinder(s) they use.

7.2.2.3.4 Gases shall be analyzed for oxygen content to an accuracy of ±1% total. This analysis shall be performed both by the person preparing the mixture and by the diver.

7.2.2.3.5 Gas mixtures standing more than 24 hrs. shall be reanalyzed.

7.2.2.3.6 When using NOAA Nitrox I (32% O₂ / 68% N₂) or NOAA Nitrox II (36% O₂ / 64% N₂), decompression tables and procedures used shall be approved by the DCB.

7.2.2.3.7 When using Nitrox Dive Tables, the analyzed FO₂ of the mixture specified may exceed the mix specified by the table as long as the diver does not exceed the MOD for that specific mix. (i.e. A diver may use a 36% O₂ mix with a table specifying a 32% O₂ mix as this is a more conservative usage of the table.)

7.2.2.3.8 If nitrox is used to increase the safety margin of air-based dive tables, the lead diver shall ensure that the MOD, oxygen exposure and time limits for the nitrox mixture being dived are not exceeded.

7.2.2.3.9 Breathing mixtures used while performing in-water decompression, or for bail-out purposes, shall contain the same or greater oxygen content as that being used during the dive, within the confines of depth limitations (see section 3.3) and the oxygen partial pressure limits (see section 7.2.2.1).

7.2.2.4 Nitrox Compatible Dive Computers:

7.2.2.4.1 Dive Computers as approved by the DCB may be used to compute decompression status during nitrox dives. Manufacturers’ guidelines and operations instructions should be followed.

7.2.2.4.2 Use of nitrox dive computers shall comply with dive computer guidelines. (See Appendix M)
7.2.2.4.3 Dive computer users shall demonstrate a clear understanding of the display, operations, and manipulation of the unit being used prior to using the computer, to the satisfaction of the DSO or designee.

7.2.2.4.4 If nitrox is used to increase the safety margin of an air-based dive computer, the lead diver shall ensure that the MOD, oxygen exposure and time limits for the nitrox mixture being used are not exceeded.

7.2.2.4.5 Dive computers capable of PO\textsubscript{2} limit and FO\textsubscript{2} adjustment shall be checked by the diver prior to the start of each dive to assure compatibility with the mix being used.

7.2.2.5 Repetitive Diving:

7.2.2.5.1 Repetitive diving using nitrox shall be performed in compliance with procedures required of the specific decompression model used.

7.2.2.5.2 Residual nitrogen time shall be based on the EAD for the specific mixture being used for the repetitive dive and not on that of the previous dive.

7.2.2.5.3 The total exposure to a partial pressure of oxygen in a given 24 hour period shall not exceed the “Total Exposure per Twenty-four (24) Hour Period”. (See section 7.2.3.2)

7.2.2.5.4 The recommended minimum surface interval time between repetitive nitrox dives shall be one hour.

7.2.3 OXYGEN PARAMETERS

7.2.3.1 Authorized Mixtures:

7.2.3.1.1 The following two enriched air mixtures will provide adequate bottom times for most divers between 60 and 130 feet and are recommended for standard use.

- NOAA Nitrox-I: 68% Nitrogen: 32% Oxygen
- NOAA Nitrox-II: 64% Nitrogen: 36% Oxygen

7.2.3.1.2 Other mixtures of greater than 21% oxygen, may be used for nitrox diving operations upon approval of the DSO. There are special requirements for equipment that is used with oxygen percents higher than 40% by volume. (See sections 5.4 and 7.4)

7.2.3.2 Oxygen Limits (CNS Limit):

All dives performed using enriched air breathing mixtures shall comply with the following NOAA Oxygen Partial Pressure Limits for “normal” exposures as listed in the NOAA manual. (NOAA Diving Manual. 2001. Best Publishing.)

<table>
<thead>
<tr>
<th>Oxygen Max PO\textsubscript{2} (ATA)</th>
<th>Single Exposure Limit (hrs)</th>
<th>24 Hour Limit (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.60</td>
<td>0.75</td>
<td>2.50</td>
</tr>
<tr>
<td>1.45</td>
<td>2.25</td>
<td>3.00</td>
</tr>
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<td>2.50</td>
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<tr>
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<td>1.30</td>
<td>3.00</td>
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<tr>
<td>1.25</td>
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<td>3.75</td>
</tr>
<tr>
<td>1.20</td>
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</tr>
<tr>
<td>1.10</td>
<td>4.00</td>
<td>4.50</td>
</tr>
<tr>
<td>1.00</td>
<td>5.00</td>
<td>5.00</td>
</tr>
</tbody>
</table>
7.2.4 GAS MIXING AND ANALYSIS

7.2.4.1 Personnel Requirements:

Individuals responsible for blending and analyzing mixtures shall be trained, have
proof of certification and experience in all aspects of the technique. Only those
individuals approved by the DCB shall be responsible for blending mixtures.

7.2.4.2 Mixing Methods:

It is the responsibility of the DCB designee to approve which of the various methods of
blending and oxygen analyzing is utilized.

7.2.4.3 Purity Standards:

Oxygen used for mixing nitrox shall meet the purity levels for “Medical Grade” (USP)
standards.

7.2.5 ANALYSIS VERIFICATION

Any cylinder marked for nitrox use must be analyzed prior to a dive. It is the
responsibility of each diver to analyze, prior to the dive, the oxygen content of
their scuba cylinder and acknowledge, in writing, the following information:

- The percents of oxygen (±1%) and nitrogen
- The Maximum Operating Depth (MOD) for the mix
- The cylinder pressure
- The date of analysis
- The diver’s signature and initials
- The cylinder serial number (on validation sheet)
- Individual dive logs must include FO$_2$ if other than 21%

7.3 GUIDELINES FOR TRAINING OF NITROX SCIENTIFIC DIVERS

7.3.1 TRAINING

The training shall be supplemental to the training requirements for air diving in
this manual and consist of additional training specific to nitrox diving.

7.3.1.1 Class Instruction:

Minimum of four (4) hours. Topics shall include: a review of previous
training, gas laws, partial pressures (limits and calculations), EAD concept
and calculation, oxygen toxicity (both CNS and pulmonary), MOD and
calculation, determination of decompression status using both the EAD
method with approved air tables and approved nitrox tables, dive planning,
blending procedures, gas analysis, oxygen cleaning, personnel and dive
station requirements, safety procedures, emergency procedures to include
recompression chamber location, availability, evacuation plans and
transport.

7.3.1.2 Practical Training:

The practical portion of the training shall consist of a review of skills as
stated in section four of the manual with the following additional training:

7.3.1.2.1 Calculations of the EAD, MOD, CNS percentages, and partial pressures for
various enriched air mixtures at various depths

7.3.1.2.2 Oxygen analysis of nitrox mixtures
7.3.1.2.3 A minimum of two open water nitrox dives with the DSO or designee. If these dives are conducted in a location where the MOD may be easily exceeded, the ratio of supervisory personnel to divers shall be 1:2.

7.3.1.3 Written Examination:

Before completion of nitrox use training the trainee must successfully pass a written examination.

7.4 NITROX DIVING EQUIPMENT

7.4.1 REQUIRED EQUIPMENT

7.4.1.1 Dedicated Cylinders:

Dedicated cylinders, both storage and scuba, shall be oxygen clean and compatible. The cylinders are restricted for use with nitrox or oil free air only. Cylinders not so designated or prepared shall not be used with nitrox mixtures. Scuba cylinders to be used with nitrox mixtures shall have the following identification documentation affixed to the cylinder:

7.4.1.1.1 Cylinders shall be clearly marked “NITROX”, “EANx” or “Enriched Air”

7.4.1.1.2 Nitrox identification color coding shall include a 4-inch wide green band around the cylinder, starting immediately below the shoulder curvature. If the cylinder is not yellow in color the green band shall be bordered above and below by a 1-inch yellow band

7.4.1.1.3 The alternate marking of a yellow cylinder by painting the cylinder crown green and printing the word “NITROX” parallel to the length of the cylinder in green print is acceptable

7.4.1.1.4 Contents shall be labeled on the cylinder and include the current FO2, cylinder pressure, date of analysis, MOD and user’s initials

7.4.1.1.5 The visual cylinder inspection record shall indicate whether the cylinder is prepared for oxygen or nitrox mixtures containing greater than 40% oxygen.

7.4.1.2 Dedicated Regulators:

When using a nitrox mixture containing more than 40% oxygen the diver must also use an oxygen clean and compatible regulator. The regulator shall be marked for nitrox use only. Dedicated regulators used with cylinders filled by an oil lubricated compressor cannot be used with mixtures over 40% until they have been cleaned.

7.4.1.3 Oxygen Analyzers:

An oxygen analyzer capable of determining the oxygen content in the diver’s cylinder prior to diving is required. The analyzer must be accurate to within 1% of the total. The use of two analyzers in parallel is recommended for comparative and verification purposes.

7.4.1.4 Oil-Free Compressor:

The compressor/filtration system must produce oil-free air. An oil free compressor is strongly recommended when producing nitrox from compressed air and oxygen.

7.4.1.5 Fill Station:

All components of a nitrox fill station that will contact nitrox mixtures containing greater than 40% oxygen shall be cleaned, maintained, and labeled for oxygen service.
7.4.1.6 Diver-Worn Support Equipment:
All diver-worn and support equipment used (in contact) with high pressure oxygen or oxygen mixtures greater than 40% by volume should be prepared, maintained, and designated for oxygen service in compliance with ASTM Pamphlet G88-90, “Designing Systems for Oxygen Service.” A copy of this document will be on file with the Diving Safety Program.

7.4.1.7 Other Equipment:
All other diving and auxiliary equipment shall cleaned, maintained, and stored in compliance with this manual.
APPENDICES
For and in consideration of permitting the Undersigned to participate in diving activities and/or class instruction of scuba diving, skin diving and/or snorkeling, the Undersigned hereby voluntarily releases, discharges, waives and relinquishes The Regents of The University Of California, its officers, agents, employees and volunteers, from any and all rights, claims, demands, causes of action and damages the Undersigned now or in the future may have of any kind, now existing or which become existent. In the future, whether the same be now known or unknown, and whether the same be now anticipated or unanticipated, resulting from personal injuries, death or property damage occurring to the Undersigned as a result of participating in or receiving instruction in scuba diving, skin diving and/or snorkeling and/or any activity(s) incidental thereto whenever and wherever the same may occur, and the Undersigned does for himself/herself, his/her heirs, assigns, executors and administrators expressly assume the risk of such injury and/or death. The Undersigned agrees that under no circumstances will he/she or his/her heirs, assigns, executors and/or administrators, present any claim for personal injury, property damage or wrongful death against The Regents Of The University Of California, its officers, agents, employees and volunteers based on non-willful conduct.

The Undersigned expressly waives all rights conferred by California Civil Code Section 1542 which states that "A general release does not extend to any claims which the creditor does not know or suspect to exist in his favor at the time of executing the release, which if known by him must materially affected his settlement with the debtor." IT IS THE INTENTION OF THE UNDERSIGNED BY THIS INSTRUMENT, TO EXPRESSLY ASSUME THE RISK OF AND TO EXEMPT AND RELIEVE THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, ITS OFFICERS, AGENTS, EMPLOYEES AND VOLUNTEERS, FROM ANY AND ALL LIABILITY FOR MY PERSONAL INJURY, PROPERTY DAMAGE (INCLUDING LOSS OF USE) OR WRONGFUL DEATH CAUSED BY THEIR NON-WILLFUL CONDUCT, INCLUDING, BUT NOT LIMITED TO NEGLIGENCE, THAT IS IN ANY WAY RELATED TO SCUBA DIVING, SKIN DIVING AND/OR SNORKELING AND/OR ANY ACTIVITY OR TRANSPORTATION RELATED THERETO.

The Undersigned, for myself, my heirs, executors, administrators and assigns, agrees that in the event any claim for my personal injuries, property damage and/or wrongful death, and/or any cross-complaint for indemnity and/or contribution arising therefrom, shall be prosecuted against The Regents Of The University Of California, or any other person or entity released herein, caused by their non-willful conduct, including negligence, due to or arising out of my participation in the activities set forth above and/or related activities, I will fully defend, indemnify and hold harmless said parties released herein from any and all such claims, judgments and causes of action by whomever and wherever made.

The Undersigned acknowledges that he/she has read the foregoing three paragraphs and is aware of the potential dangers involved in or incidental to engaging in the activities set forth above, including, but not limited to, the risk of severe injury or death due to water temperature, depth diving, water pressure changes, dive boat accidents, weather and ocean conditions, contact with marine animal and/or plant life, diving equipment failure, hazardous ocean bottom topography, instructor and/or co-participant negligence and other non-willful conduct and lack of readily available medical care and treatment (including a recompression chamber), and is fully aware of the legal consequences of signing this instrument. If I am under eighteen (18) years of age, I warrant that this document has also been signed by my parents or legal guardian.

PARTICIPANT: ____________________________
(Signature) (Print Name) (Today's Date)

WITNESS: ____________________________
(Signature) (Print Name) (Today's Date)

PARENTS/GUARDIAN: ____________________________
(Signature) (Print Name(s)) (Today's Date)

NAME AND TELEPHONE NUMBER OF PERSON TO CONTACT IN CASE OF EMERGENCY:

Original: Department Sponsoring Activity (retain for three (3) years after dive) Copy: Dive Participant
Appendix B

DIVING EMERGENCY MANAGEMENT PROCEDURES

Introduction

A diving accident victim could be any person who has been breathing air underwater regardless of depth. It is essential that emergency procedures are pre-planned and that medical treatment is initiated as soon as possible. Below are the guidelines procedures for diving emergencies including evacuation and medical treatment for each dive location.

General Procedures

Depending on and according to the nature of the diving accident, stabilize the patient, administer 100% oxygen, contact local Emergency Medical System (EMS) for transport to medical facility, contact diving accident coordinator, as appropriate. Explain the circumstances of the dive incident to the evacuation teams, medics and physicians. Do not assume that they understand why 100% oxygen may be required for the diving accident victim or that recompression treatment may be necessary.

1. Make appropriate contact with victim or rescue as required.
2. Establish (A)irway, (B)reathing, (C)irculation as required.
3. Administer 100% oxygen, if appropriate (in cases of Decompression Illness, or Near Drowning).
4. Call local Emergency Medical System (EMS) for transport to nearest medical treatment facility.
5. Call appropriate Diving Accident Coordinator for contact with diving physician and recompression chamber, etc.
6. Notify DSO or designee according to the Emergency Action Plan of the organizational member.
7. Complete and submit Incident Report Form the UC Berkeley Diving Control Board.

List of Emergency Contact Numbers Appropriate For Dive Location:
ACCIDENT/INJURY REPORT

1. Describe the accident in detail.

2. Date_________ Place (a) deepest depth of dive_________ depth of accident
   (b) in-water location_______ (c) nearest land
   (d) city_______ (e) state____ (f) country

3. Person injured____________________________ Certification number______________

5. Was hospitalization or recompression required? _____ If yes, explain.

(a) location of hospital and/or recompression chamber__________ (b) name of attending physician
__________ (c) duration of hospitalization or treatment in chamber________________________ (d) Did
the injured fully recover?_______ If no, what were the residual effects? Describe fully.

6. Did this injury result in loss of time from research, classes, or work?
   • If yes, how many work days?

7. What skills or exercises might be appropriate training for divers to deal effectively with this sort of
   accident/injury? Please discuss.

8. Does the injured have DAN insurance?

9. Buddy's name____________________ Certification number__________________________

10. Your name_______________ Certification number_____________________

11. Your signature________________________ Date________________________

12. Diving Officer____________________ Date________________________

13. A separate follow-up report must be filed with the Diving Safety Officer. UC employees and
graduated students need to file the appropriate paperwork with their home department. Students need
to file the appropriate paperwork with their home department.
INCIDENT REPORT

1. Describe the incident in detail.

2. Date______ Place (a) deepest depth of dive______________ depth of incident__________
   (b) in-water location_____________ (c) nearest land___________________ (d) city_____________________
   (e) state_________ (f) country__________

3. Buddy's name__________________________________________ Certification number__________

4. Your name____________________________________________ Certification number__________

5. Your signature_________________________________________ Date_____________________

6. Diving Officer__________________________________________ Date_____________________

7. A separate follow-up report must be filed with the Diving Safety Officer. UC employees and
   graduate students need to file the appropriate paperwork with their home department. Students need
   to file the appropriate paperwork with their home department.
Appendix D

RESEARCH DIVING ACTIVITY FORM
Division of Diving Safety
(510) 642-1298 ph./ (510) 642-0850 FAX
University of California Berkeley Diving Control Board

Anticipated Project start date_______ end date_______
Name (Project Director)_____________________

Contact information: Phone FAX e-mail

University Status (circle one): Faculty Staff Graduate Undergraduate Visiting Researcher

Name (lead diver)________________________ Certification depth:_________

University Status (circle one): Faculty Staff Graduate Undergraduate Visiting Researcher

Faculty or University affiliated sponsor (if appropriate):____________________

Name(s) dive buddies: UCB certification depth or Other Institution affiliation

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Please outline your research project, focusing on the diving aspect of the research. Include the following:

- Breathing gas supply and mode.
- Decompression status indicator used (tables and/or computer).
- Diver thermal protection.
- Emergency procedures you will follow (see section 2.13 of the Diving Safety Manual) include emergency evacuation plans
- Dive profiles expected, including diving depths, bottom times and number of repetitive dives expected per day.
- Appropriate out-of-air protocol to be used (dives deeper than 100 feet may require a redundant air source)
- Diving conditions expected (visibility, wave exposure, wall diving etc., contaminants, currents). Please detail any potentially hazardous conditions.
- Boat use and/or beach access plan.
- Specialty equipment use (i.e., scooters {DPVs}, lift bags, cameras, dredges, drills, cores, blue water rigs, etc.)
- Sampling methods to be used (i.e., transects/quadrats, collecting {explain collecting methods}, etc.)

Diving Safety Officer approval  DCB chairperson approval
________________________________________Date:________________________

________________________________________Date:
Appendix E

Information Required on Diving Log

(See section 2.27)

The Diving Log shall be in a form specified by the Diving Control Board and shall include at least the following:

1. Name of diver and permit number.
2. Name and permit number of partner.
3. Date, depth, location, and purpose of dive.
4. Time underwater.
5. Repetitive groups before and after the dive.
6. Indicate if the dive was cold and/or arduous.
7. Time and depth of safety stop.
8. Detailed report of any accident or potentially dangerous incident.
9. Diving mode used if other than open-circuit SCUBA
10. Dive tables or computer used.
11. Occurrence of any illness in the preceding month requiring hospitalization or limiting the ability to dive.
Guidelines and Key For UC Berkeley Dive Logs

1 Submit this log to the Diving Safety Officer at the Division of Diving Safety, 105 Hearst Gym, by the 5th day of the following month. If no dives were made, then indicate with "No Dives" on the log sheet.
   E-mail logs can be sent to ucbdiver@uclink4.berkeley.edu

2 Separate, detailed reports must be filed on the appropriate forms with the Diving Safety Officer for all accidents, incidents, potentially dangerous situations, and any equipment failures.

3 The University of California, Berkeley is not responsible for any sport dives conducted by UCB Scientific Divers.
   Sport dives are not to be interspersed with Scientific dives. (See section 2.12 of the Diving Safety Manual)
   Sport dives may or may not be counted toward maintaining current status at the discretion of the Diving Safety Officer.

4 Purpose
   R = Research conducted under UC Berkeley Auspices, or under reciprocity agreements
   T = Training conducted under UC Berkeley Auspices or under reciprocity agreements
   O = All other dives

5 Group In = Repetitive group before the dive according to NAUI or Michigan (Hugi) tables

6 Max Depth = Maximum depth obtained on the dive.

7 Time In = Time at start of descent.

8 Time Out = Time upon reaching the surface.

9 TBT = Total Bottom Time (total time underwater)

10 Group Out = Repetitive group at the end of the dive according to the NAUI or Michigan (Hugi) tables

11 T / C = Was a Table or Computer used to monitor decompression status?

12 SS = Safety Stop The Division of Diving Safety recommends a precautionary stop
   for a minimum of three minutes between 15' and 20' on all dives deeper than 30'.

13 C / A = Was the dive cold and/or arduous?
   Please note the correct procedure listed below for planning and use of tables on cold and/or arduous dives.
   If a dive was cold or arduous use the next greater bottom time on your tables.
   If a dive was cold and arduous, then use the next greater bottom time
   and the next greater depth for your schedule.

14 Environment or Technology: Please indicate if the dive included any of the following:
   Nitrox
   Required Decompression
   Surface Supplied
   Blue Water
   Overhead
   Mixed Gas
   Saturation
   Hookah
   Ice / Polar
   Rebreather

You may want to photocopy your logs for your personal records
Appendix F

UNIVERSITY OF CALIFORNIA, BERKELEY
DIVISION OF DIVING CONTROL
APPLICATION FOR TRAINING AND PERMITTING

Name ____________________________

<table>
<thead>
<tr>
<th>Last</th>
<th>First</th>
<th>Middle</th>
<th>Sex</th>
<th>Birth date</th>
<th>Age</th>
</tr>
</thead>
</table>

Address ____________________________

<table>
<thead>
<tr>
<th>Local Residence</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
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<tbody>
<tr>
<td>Telephone</td>
<td>(______)</td>
<td></td>
<td></td>
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<tr>
<td>E-mail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Address ____________________________

<table>
<thead>
<tr>
<th>Permanent (Parent's) Address</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone</td>
<td>(____)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Address ____________________________

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<thead>
<tr>
<th>Campus (Dept./Unit)</th>
<th>Room</th>
<th>Building</th>
</tr>
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<tbody>
<tr>
<td>Telephone</td>
<td>(____)</td>
<td></td>
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</tbody>
</table>

Department ____________________________

<table>
<thead>
<tr>
<th>Major</th>
<th>Undergrad or Grad</th>
<th>Year</th>
</tr>
</thead>
</table>

Major Professor, Faculty Advisor or Agency Supervisor

Insurance Beneficiary (Relative or friend) ____________________________

<table>
<thead>
<tr>
<th>Street</th>
<th>City</th>
<th>State</th>
<th>Zip</th>
</tr>
</thead>
</table>


Personal Physician: Name, Address, (Area Code) Telephone

University scientific diving permitting allows the use of self-contained underwater breathing apparatus by those persons who have need of this tool in their study, research or work. Persons intending to engage in diving projects under the auspices of the University of California are eligible for training and permitting. The applicant agrees that all diving will be carried out in accordance with the provisions of the Diving Safety Manual, University of California, Berkeley. Violation of any regulation may result in revocation or restriction of permit. State how you plan to use diving in your study or research.

Applicant's Signature ____________________________ Date ____________________________

Departmental Approval: Chairman, Major ____________________________ Department Professor, Supervisor or Advisor (Signature) Date ____________________________

Diving Control Board Approval: ____________________________ Date ____________________________

University Diving Safety Officer ____________________________ Date ____________________________
Swimming Experience
Indicate no. of years, ratings, certifications, or awards held (YMCA, Red Cross, etc.)

Swimming

Open Water

Life saving

Water safety instructor

Competition (events & times)

Diving Experience

Breath-hold diving

SCUBA

Rebreather or hooka

Hard hat & depth rating

Mixed gas & depth rating

Study or research

Underwater photography

Spearfishing or other

List swimming and diving jobs you have held:

List approximate number of SCUBA dives you have made in the following depth ranges:

0-25 ft. _____ 26-60 ft. _____ 61-100 ft. _____ 101-130 ft. _____ 131-150 ft. _____ 151-200 ft. _____

List locations you have dived

List any special requirements for diving

Applicant's Signature

Date

Diving Safety Officer

Date
Appendix G

University of California, Berkeley
Division of Diving Safety and Diving Control Board

MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT

Name of Applicant (Print or Type) ________________________________

Date (Mo/Day/Year) ________________________________

APPLICANT’S RELEASE OF MEDICAL INFORMATION:

I do hereby authorize the release of this information and all medical information subsequently acquired in association with my diving to the UC Berkeley Diving Safety Officer and the Diving Control Board or their designee at ________________________________ on _________________.

(medical facility)  (date)

Signature of Applicant: ________________________________

TO THE EXAMINING PHYSICIAN:

This person is an applicant for training or is presently certified to engage in diving with self-contained underwater breathing apparatus (SCUBA). This is an activity which puts unusual stress on the individual in several ways. Your opinion on the applicant’s medical fitness is requested. Scuba diving requires heavy exertion. The diver must be free of cardiovascular and respiratory disease. An absolute requirement is the ability of the lungs, middle ear and sinuses to equalize pressure. Any condition that risks the loss of consciousness should disqualify the applicant. If you have questions about diving medicine, you may wish to consult one of the references on the attached list, or contact the Divers Alert Network at 1-919-684-2948.

Please contact the Diving Safety Officer if you have questions or concerns about diving medicine or the UC Berkeley standards. Thank You for your assistance.

__________________________  __________________________
Diving Safety Officer        Date

__________________________  __________________________
Printed Name         Phone

RECOMMENDATION

After completing all the tests required at this time, I recommend:

[ ] APPROVAL. I find no medical condition(s) which I consider incompatible with diving.

[ ] RESTRICTED ACTIVITY APPROVAL. The applicant may dive in certain circumstances as described in REMARKS.

[ ] FURTHER TESTING REQUIRED. I have encountered a potential contraindication to diving. Additional medical tests must be performed before a final assessment can be made. See REMARKS.

[ ] REJECT. This applicant has medical condition(s) which, in my opinion, clearly would constitute unacceptable hazards to health and safety in diving.
REMARKS:

I have discussed the patient’s medical condition(s) which would not seriously interfere with diving but which may seriously compromise subsequent health. The patient understands the nature of the hazards and the risks involved in diving with these defects.

M.D.  

Date   Signature       Phone

Name (Print or Type)       Address

My familiarity with applicant is:

- With this exam only
- Regular Physician for ________ years
- Other (describe) ____________________________

My familiarity with diving medicine is: ____________________________

SELECTED REFERENCES IN DIVING MEDICINE

Most of these are available from Best Publishing Company, P.O. Box 30100, Flagstaff AZ. 86003-0100, the Divers Alert Network (DAN), or the Undersea and Hyperbaric Medical Association (UHMS), Bethesda, MD.


NOAA Diving Manual, J. diver, Best Publishing Company, P.O. Box 30100, Flagstaff AZ. 86003-0100

SCUBA DIVING IN SAFETY AND HEALTH, C.W. Deuker. Madison Publishing Associates, Diving Safety Digest, P.O. Box 2735, Menlo Park, CA. 94026


Divers are required to submit to medical interview or examination after each serious injury or illness. (Diving Safety Manual3.41.B)

TESTS:

[ ] Initial examination under age 40
- Medical History
- Complete Physical Exam, emphasis on neurological and otological components
- Chest X-ray
- Spirometry
- Hematocrit or Hemoglobin
- Urinalysis
- Any further tests deemed necessary by the physician

[ ] Re-examination under age 40 (every 5 years)
- Medical History
- Complete Physical Exam, emphasis on neurological and otological components
- Hematocrit or Hemoglobin
- Urinalysis
- Any further tests deemed necessary by the physician

[ ] Initial exam over age 40
- Medical History
- Complete Physical Exam, emphasis on neurological and otological components
- Assessment of coronary artery disease risk factors including lipid profile and diabetic screening
- Resting EKG
- Chest X-ray
- Spirometry
- Hematocrit or Hemoglobin
- Urinalysis
- Any further tests deemed necessary by the physician
  - Exercise stress testing may be indicated based on risk factors

[ ] Periodic re-examination over age 40 (every 3 years); over age 60 (every two years)
- Medical History
- Complete Physical Exam, emphasis on neurological and otological components
- Assessment of coronary artery disease risk factors including lipid profile and diabetic screening
- Resting EKG
- Hematocrit or Hemoglobin
- Urinalysis
- Any further tests deemed necessary by the physician
  - Exercise stress testing may be indicated based on risk factors
CONDITIONS WHICH MAY DISQUALIFY CANDIDATES FROM DIVING
(Adapted from Bove, 1998: bracketed numbers are pages in Bove.)

1. Abnormalities of the tympanic membrane, such as perforation, presence of a monomeric membrane, or inability to autoinflate the middle ears. [5,7,8,9]
2. Vertigo including Meniere's Disease. [13]
4. Recent ocular surgery. [15,18,19]
5. Psychiatric disorders including claustrophobia, suicidal ideation, psychosis, anxiety states, untreated depression. [20 - 23]
6. Substance abuse, including alcohol. [24-25]
7. Episodic loss of consciousness. [1, 26,27]
8. History of seizure. [27, 28]
9. History of stroke or a fixed neurological deficit. [29,30]
10. Recurring neurologic disorders, including transient ischemic attacks. [29,30]
11. History of intracranial aneurysm, other vascular malformation or intracranial hemorrhage. [31]
12. History of neurological decompression illness with residual deficit. [29,30]
13. Head injury with sequelae. [26, 27]
14. Hematologic disorders including coagulopathies. [41, 42]
15. Evidence of coronary artery disease or high risk for coronary artery disease. [33 - 35]
16. Atrial septal defects. [39]
17. Significant valvular heart disease - isolated mitral valve prolapse is not disqualifying. [38]
18. Significant cardiac rhythm or conduction abnormalities. [36 - 37]
19. Implanted cardiac pacemakers and cardiac defibrillators (ICD). [39, 40]
20. Inadequate exercise tolerance. [34]
21. Severe hypertension. [35]
22. History of spontaneous or traumatic pneumothorax. [45]
23. Asthma. [42 - 44]
24. Chronic pulmonary disease, including radiographic evidence of pulmonary blebs, bullae or cysts.[45,46]
25. Diabetes mellitus. [46 - 47]
26. Pregnancy. [56]
APPENDIX 3
DIVING MEDICAL HISTORY FORM
(To Be Completed By Applicant-Diver)

Name ___________________________ Sex ___ Age ___ Wt. ___ Ht. ___

Sponsor ___________________________ Date __/__/____
(Dept./Project/Program/School, etc.) (Mo/Day/Yr)

TO THE APPLICANT:

Scuba diving makes considerable demands on you, both physically and mentally. Diving with certain medical conditions may be asking for trouble not only for yourself, but also to anyone coming to your aid if you get into difficulty in the water. Therefore, it is prudent to meet certain medical and physical requirements before beginning a diving or training program.

Your answers to the questions are as important, in determining your fitness as your physical examination. Obviously, you should give accurate information or the medical screening procedure becomes useless.

This form shall be kept confidential. If you believe any question amounts to invasion of your privacy, you may elect to omit an answer, provided that you shall subsequently discuss that matter with your own physician and he/she must then indicate, in writing, that you have done so and that no health hazard exists.

Should your answers indicate a condition, which might make diving hazardous, you will be asked to review the matter with your physician. In such instances, his/her written authorization will be required in order for further consideration to be given to your application. If your physician concludes that diving would involve undue risk for you, remember that he/she is concerned only with your well-being and safety. Please respect the advice and the intent of this medical history form.

<table>
<thead>
<tr>
<th>Have you ever had or do you presently have any of the following?</th>
<th>Yes</th>
<th>No</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trouble with your ears, including ruptured eardrum, difficulty clearing your ears, or surgery.</td>
<td></td>
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<tr>
<td>2. Trouble with dizziness.</td>
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<tr>
<td>3. Eye surgery.</td>
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<tr>
<td>4. Depression, anxiety, claustrophobia, etc.</td>
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<tr>
<td>5. Substance abuse, including alcohol.</td>
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<tr>
<td>7. Epilepsy or other seizures, convulsions or fits.</td>
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<tr>
<td>8. Stroke or a fixed neurological deficit.</td>
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<tr>
<td>9. Recurring neurologic disorders, including transient ischemic attacks.</td>
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<tr>
<td>10. Aneurysms or bleeding in the brain.</td>
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<tr>
<td>11. Decompression sickness or embolism.</td>
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<td></td>
</tr>
<tr>
<td>12. Head injury</td>
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<td></td>
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<tr>
<td>13. Disorders of the blood, or easy bleeding.</td>
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<td></td>
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<tr>
<td>14. Heart disease, diabetes, high cholesterol</td>
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<tr>
<td>15. Anatomical heart abnormalities including patent foramen ovale, valve problems, etc.</td>
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<tr>
<td>16. Heart rhythm problems.</td>
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<tr>
<td>17. Need for a pacemaker</td>
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<tr>
<td>18. Difficulty with exercise.</td>
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<tr>
<td>19. High blood pressure</td>
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<td></td>
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<tr>
<td>20. Collapsed lung</td>
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<tr>
<td>22. Other lung disease.</td>
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<td></td>
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<tr>
<td>23. Diabetes mellitus.</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
24. Pregnancy
25. Surgery If yes explain below
26. Hospitalizations. If yes explain below
27. Do you take any medications? If yes list below
28. Do you have any allergies to medications, foods, environmentals? If yes explain below
29. Do you smoke?
30. Do you drink alcoholic beverages?
31. Is there a family history of high cholesterol?
32. Is there a family history of heart disease or stroke?
33. Is there a family history of diabetes?
34. Is there a family history of asthma?

Please explain any “yes” answers to the above questions.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

I certify that the above answers and information represent an accurate and complete description of my medical history.

Signature _____________________________ Date ____________
Appendix I

AAUS REQUEST FOR DIVING RECIPROCITY FORM
VERIFICATION OF DIVER TRAINING AND EXPERIENCE

A scientific diver that is currently certified under the auspices of an organizational member institution of the American Academy of Underwater Sciences (AAUS) shall be recognized by any other organizational member of AAUS and may apply for reciprocity in order to dive with the host organization. Organizational members that are in good standing with AAUS operate, at a minimum, under the AAUS Standards for Scientific Diving Certification and Operation of Scientific Diving Programs (1996 edition). The visiting diver will comply with the diving regulations of the host organization’s Diving Safety Manual unless previously arranged by both organization’s Diving Control Boards.

The host organization has the right to approve or deny this request and may require, at a minimum, a checkout dive with the Diving Safety Officer (DSO) or designee of the host organization. If the request is denied, the host organization should notify to the DSO of the visiting diver the reason for the denial. The DSO for the visiting scientific diver has confirmed the following information:

(Date)

_____ Written scientific diving examination
_____ Last diving medical examination
_____ Most recent checkout dive
_____ Scuba regulator/equipment service/test
_____ CPR training (Agency) ______________
_____ Oxygen administration (Agency) ______________
_____ First aid for diving ______________
_____ Date of last dive ______________

Number of dives completed within previous 12 months? ____
Depth certification _____
Any restrictions? (Y/N) ____ if yes, explain:

Please check any pertinent specialty certifications:

_____ Dry suit __________ Rescue
_____ Dive Computer __________ Divemaster
_____ Nitrox __________ Instructor
_____ Mixed gas __________ EMT
_____ Closed circuit __________ Dive Accident Management
_____ Saturation __________ Chamber operator
_____ Decompression __________ Lifesaving

_____ Blue water
_____ Altitude
_____ Ice/Polar
_____ Cave
_____ Night

Other ______________

Name of diver: ______________

Emergency Information: (To notify in an emergency)
Name: ______________
Relationship: ______________
Telephone: (work) ______________ (home) ______________
Address: ______________

This is to verify that the above individual is currently a certified scientific diver at

The University of California at Berkeley

Diving Safety Officer:

(Signature) ______________ (Date) ______________

(Print) ______________ (Telephone, FAX, Email)
Appendix J

Administrative Procedures for Permit Approval
Suspension or Restriction of Diving Privileges
and Review of Decisions

I. Permitting
A. If DSO recommends permitting to DCB:
   1. DCB Chair acts on behalf of DCB to approve.
   2. If Chair does not approve permitting, case is referred to entire DCB.
      a. DCB meets to review and act on proposed permitting.
         1) Meeting held within a reasonable time limit.
         2) Meeting is closed.
         3) A majority of DCB members must be present.
      4) DSO, DCB Chair may be present to state case and/or may submit written
         statements for consideration by the DCB.
      5) Diver in question may be present to state case and/or may submit written
         statements for consideration by the DCB.

B. If DSO denies permitting:
   1. DSO must report to DCB all requests for permitting that are denied and reasons for
      denials.
   2. Diver may, with approval of DSO and DCB Chair, undergo additional training and then
      resubmit a request to DSO for permitting.
   3. Diver may appeal decision to DCB. All such appeals will be processed as in Section
      IA2a (above).

C. If DCB does not approve permitting:
   1. Diver may, with approval of DSO and DCB Chair, undergo additional training and then
      resubmit a request to DSO and the DCB for permitting.
   2. Diver may request review of denial of permitting (Section III).

II. Suspension, restriction or revocation of diving privileges
A. If DSO suspends, restricts or revokes diving privileges he/she must report action and
   reasons for action immediately in writing to DCB Chair and members of DCB.

B. DCB Chair must then call DCB meeting to review and vote on suspension, restriction or
   revocation.
   1. Meet within reasonable time.
   2. A majority of DCB members must be present.
   3. Meeting is closed.
   4. DSO must be present to state case and may submit written statement for consideration by
      DCB.
   5. Diver in question may be present to state case and/or may submit written statement for
      consideration by DCB.

C. If DCB approves suspension, restriction or revocation of diving privileges:
   1. Diver may, with approval of DCB, undergo additional training and then submit a request
      to DCB for repermitting or removal of restrictions. These requests will be processed according to Section II.B (above).
   2. Diver may request review of suspension, restriction or revocation of diving permit
      (Section III).
III. Review of permitting suspension, restriction or revocation of diving privileges
   A. Procedure:
      1. Diver must submit written request for review outlining case to Vice Chancellor for
         Research (VCR) with copy to DCB Chair and the Division of Diving Control (DDC) for
         distribution to DCB.

      2. VCR will then ask diver, DSO, and DCB to submit written statements outlining reasons
         for DCB action.

      3. VCR will ask EH&$ Policy Committee CO-Chairs to appoint an ad hoc subcommittee
         (which may include non EH&$ Policy Committee Members) to coordinate the review of
         the case and will submit diver's, DSO's and DCB's written statements to ad hoc
         subcommittee.

      4. EH&$ Policy Committee ad hoc subcommittee will forward the results of the review, via
         the CO-Chairs, to VCR for transmission to DCB for reevaluation.
Appendix K

DEFINITION OF TERMS

Air sharing - The sharing of an air supply between divers.

Bottom Time - The total elapsed time measured in minutes from the time when the diver leaves the surface in descent to the time that the diver begins a direct ascent to the surface.

Breath-hold Diving - A diving mode in which the diver uses no self-contained or surface-supplied air or oxygen supply.

Buddy Breathing - The sharing of a single air source between divers.

Buddy Diver - Second member of the dive team.

Buddy system - Two comparably equipped scuba divers in the water in constant communication.

Buoyant Ascent - An ascent made using some form of positive buoyancy.

Burst Pressure - The pressure at which a pressure containment device would fail structurally.

Certified Diver - A diver who holds a recognized valid certification from a organizational member or recognized certifying agency.

Controlled Ascent - Any one of several kinds of ascents including normal, swimming, and air sharing ascents where the diver(s) maintain control so a pause or stop can be made during the ascent.

Cylinder - A pressure vessel for the storage of gases.

Decompression Chamber - A pressure vessel for human occupancy. Also called a hyperbaric chamber or recompression chamber.

Decompression Sickness - A condition with a variety of symptoms which may result from gas and bubbles in the tissues of divers after pressure reduction.

Decompression Table - A profile or set of profiles of depth-time relationships for ascent rates and breathing mixtures to be followed after a specific depth-time exposure or exposures. (Also called dive tables.)

Dive - A descent into the water, an underwater diving activity utilizing compressed gas, an ascent, and return to the surface.

Dive Computer - A microprocessor based device which computes a diver's theoretical decompression status, in real time, by using pressure(depth) and time as input to a decompression model, or set of decompression tables, programmed into the device.

Dive Location - A surface or vessel from which a diving operation is conducted.

Dive Site - The physical location of a diver during a dive.

Diver - An individual in the water who uses apparatus, including snorkel, which supplies breathing gas at ambient pressure.
Diver-In-Training - An individual gaining experience and training in additional diving activities under the supervision of a dive team member experienced in those activities.
Diver-Carried Reserve Breathing Gas - A diver-carried independent supply of air or mixed gas (as appropriate) sufficient under standard operating conditions to allow the diver to reach the surface, or another source of breathing gas, or to be reached by another diver.

Diving Mode - A type of diving required specific equipment, procedures, and techniques, for example, snorkel, scuba, surface-supplied air, or mixed gas.

Diving Control Board (DCB). The group of individuals who act as the official representative of the membership organization in matters concerning the scientific diving program (see Sec. 1.24).

Diving Safety Officer (DSO) - The individual responsible for the safe conduct of the scientific diving program of the membership organization (see Sec. 1.23).

Emergency Ascent - An ascent made under emergency conditions where the diver exceeds the normal ascent rate.

FSW - Feet of seawater, or equivalent static head.

Hookah Diving - A type of shallow water surface-supplied diving where there is no voice communication with the surface.

Hyperbaric Chamber - See decompression chamber.

Hyperbaric Conditions - Pressure conditions in excess of normal atmospheric pressure at the dive location.

Lead Diver - The certified scientific diver with experience and training to conduct the diving operation.

Maximum Working Pressure - The maximum pressure to which a pressure vessel may be exposed under standard operating conditions.

Organizational member - An organization which is a current member of the AAUS, and which has a program which adheres to the standards of the AAUS as set forth in the AAUS Standards for Scientific Diving Certification and Operation of Scientific Diving Programs.

Mixed-Gas Diving - A diving mode in which the diver is supplied in the water with a breathing gas other than air.

MSW - Meters of seawater or equivalent static head.

No-Decompression limits - The depth-time limits of the "no-decompression limits and repetitive dive group designations table for no-decompression air dives" of the U.S. Navy Diving Manual or equivalent limits.

Normal Ascent - An ascent made with an adequate air supply at a rate of 60 feet per minute or less.

Pressure-Related Injury - An injury resulting from pressure disequilibrium within the body as the result of hyperbaric exposure. Examples include: decompression sickness, pneumothorax, mediastinal emphysema, air embolism, subcutaneous emphysema, or ruptured eardrum.
Pressure Vessel - See cylinder.

Psig - pounds per square inch gauge.

Recompression Chamber - see decompression chamber.

Scientific Diving - Scientific diving is defined (29 CFR 1910.402) as diving performed solely as a necessary part of a scientific, research, or educational activity by employees whose sole purpose for diving is to perform scientific research tasks.

Scuba Diving - A diving mode independent of surface supply in which the diver uses open circuit self-contained underwater breathing apparatus.

Standby Diver - A diver at the dive location capable of rendering assistance to a diver in the water.

Surface Supplied Diving - A diving mode in which the diver in the water is supplied from the dive location with compressed gas for breathing.

Swimming Ascent - An ascent which can be done under normal or emergency conditions accomplished by simply swimming to the surface.

Umbilical - The composite hose bundle between a dive location and a diver or bell, or between a diver and a bell, which supplies a diver or bell with breathing gas, communications, power, or heat, as appropriate to the diving mode or conditions, and includes a safety line between the diver and the dive location.

Working Pressure - The normal pressure at which the system is designed to operate.
Appendix L

Decompression Models

The following dive tables are currently approved by the Diving Control Board:

1. NAUI (1990 or later) Tables

2. Michigan Sea Grant College Program Tables, Michigan State University

Dive Computer Use Guidelines:

1. Dive computers must be approved by the Diving Safety Officer. Downloadable dive computers are recommended by the Diving Control Board.

2. Divers wishing to use dive computers while diving under the auspices of UC Berkeley must get approval from the DSO, complete an appropriate training session, and complete a written exam.

3. Each diver in a dive team must have their own computer if using the dive computer to determine decompression status.

4. If dive team members are using dive computers with different decompression models, all dive team members must follow the most conservative dive computer.

5. If the dive computer fails at any time during the dive, the dive must be terminated and appropriate surfacing procedures initiated.

6. A diver should not dive for 24 hours prior to using a dive computer to monitor decompression status for subsequent dives.

7. Once the dive computer is in use, it must not be switched off until it indicates that complete off gassing has occurred.

8. When using a dive computer, normal ascents are to be at a rate specified by the make and model of the model being used.

9. Ascent rates should not exceed 40 fsw/min in the last 60 feet to the surface.

10. Whenever practical, divers should make a safety stop between 10 and 30 feet for 3-5 minutes.

11. Repetitive dives must be executed in a sequence of dives to decreasing depths (deepest dive first). Multilevel dives must be executed with the deepest part of the dive first, followed by gradually decreasing depths.