WALLA WALLA UNIVERSITY

STANDARDS FOR SCIENTIFIC DIVING

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FOREWORD

Since 1951 the scientific diving community has endeavored to promote safe, effective diving through self-imposed diver training and education programs. Over the years, manuals for diving safety have been circulated between organizations, revised and modified for local implementation, and have resulted in an enviable safety record.

This document has been modified from the American Academy of Underwater Sciences (AAUS) “Standards for Scientific Diving”, 2016 revision, which represents the minimal safety standards for scientific diving at the present day. As diving science progresses so shall these Standards.
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SECTION 1.00 GENERAL POLICY

1.10 Scientific Diving Standards

Purpose

The purpose of these Scientific Diving Standards is to ensure that all scientific diving is conducted in a manner that will maximize protection of scientific divers from accidental injury and/or illness, and to set forth standards for training and certification of scientific divers that will allow a working reciprocity between organizational members of the American Academy of Underwater Sciences (AAUS). Fulfillment of the purposes shall be consistent with the furtherance of research and safety.

These standards include and expand on the minimal standards for the establishment of AAUS recognized scientific diving programs, the organization for the conduct of these programs, and the basic regulations and procedures for safety in scientific diving operations. They also establish a framework for reciprocity between AAUS organizational members that adhere to these minimum standards.

In 1982, OSHA exempted scientific diving from commercial diving regulations (29CFR1910, Subpart T) under certain conditions that are outlined below. The final guidelines for the exemption became effective in 1985 (Federal Register, Vol. 50, No.6, p.1046). AAUS is recognized by OSHA as the scientific diving standard setting organization.

Washington State Administrative Code (WAC) Chapter 296-37 describes the standards for commercial diving operations. Appendix B to WAC Chapter 296-37 lists the guidelines for scientific diving. It is the intent of these Scientific Diving Standards to meet or exceed all relevant Federal and State Standards.

Additional standards that extend this document have been adopted by Walla Walla University, according to local procedure. Copies of these Scientific Diving Standards must be available to all personnel covered by its scope.

Scientific Diving Definition

Scientific diving is defined (29CFR1910.402) 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.

Scientific Diving Exemption

OSHA has granted an exemption for scientific diving from commercial diving regulations under the following guidelines (Appendix B to 29CFR1910 Subpart T):

a) The Diving Control Board consists of a majority of active scientific divers and has autonomous and absolute authority over the scientific diving program’s operation.

b) The purpose of the project using scientific diving is the advancement of science; therefore, information and data resulting from the project are non-proprietary.

c) The tasks of a scientific diver are those of an observer and data gatherer. Construction and trouble-shooting tasks traditionally associated with commercial diving are not included within scientific diving.

d) Scientific divers, based on the nature of their activities, must use scientific expertise in studying the underwater environment and therefore, are scientists or scientists-in-training.
In addition, the scientific diving program shall contain at least the following elements (29 CFR 1910.401):

a) Diving safety manual, which includes at a minimum: Procedures covering all diving operations specific to the program; including procedures for emergency care, recompression and evacuation, and the criteria for diver training and certification.

b) Diving control (safety) board, with the majority of its members being active scientific 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, certify the depths to which a diver has been trained, take disciplinary action for unsafe practices, and assure adherence to the buddy system (a diver is accompanied by and is in continuous contact with another diver in the water) for scuba diving.

*Review of Standards*

As part of Walla Walla University’s annual report, any recommendations for modifications of these standards shall be submitted to the AAUS for consideration.

### 1.20 Operational Control

**Walla Walla University Auspices Defined**

For the purposes of these standards the auspices of Walla Walla University includes any scientific diving operation in which Walla Walla University is connected because of ownership of any equipment used, locations selected, or relationship with the individual(s) concerned. This includes all cases involving the operations of employees of Walla Walla University or employees of auxiliary organizations, where such employees are acting within the scope of their employment, and the operations of other persons who are engaged in scientific diving of Walla Walla University or are diving as members of an organization recognized by Walla Walla University.

It is Walla Walla University’s responsibility to adhere to the AAUS Standards for Scientific Diving Certification and Operation of Scientific Diving Programs. The administration of the local diving program will reside with the Walla Walla University Diving Control Board (DCB).

The regulations herein shall be observed at all locations where scientific diving is conducted.

*The Walla Walla University Scientific Diving Standards and Safety Manual*

Walla Walla University developed and maintains a scientific diving safety manual that provides for the development and implementation of policies and procedures that will enable Walla Walla University to meet requirements of local environments and conditions as well as to comply with the AAUS scientific diving standards. The scientific diving manual shall include, but is not limited to:

1. AAUS standards used as a set of minimal guidelines for the development of Walla Walla University’s scientific diving safety manual.
2. Emergency evacuation and medical treatment procedures.
4. Standards written or adopted by reference for each diving mode utilized which include the following:
   a. Safety procedures for the diving operation.
b. Responsibilities of the dive team members.
c. Equipment use and maintenance procedures.
d. Emergency procedures.

Diving Safety Officer

The Diving Safety Officer (DSO) serves as a member of the Diving Control Board (DCB). This person should have broad technical and scientific expertise in research related diving.

Qualifications:

1. Shall be appointed by the responsible administrative officer or designee, with the advice and counsel of the Diving Control Board.
2. Shall be trained as a scientific diver.
3. Shall be a full member as defined by AAUS.
4. Shall be an active underwater instructor from an internationally recognized certifying agency.

Duties and Responsibilities

1. Shall be responsible, through the DCB, to the responsible administrative officer or designee, for the conduct of the scientific diving program Walla Walla University. The routine operational authority for this program, including the conduct of training and certification, approval of dive plans, maintenance of diving records, and ensuring compliance with this standard and all relevant regulations of Walla Walla University, rests with the Diving Safety Officer.
2. May permit portions of this program to be carried out by a qualified delegate, although the Diving Safety Officer may not delegate responsibility for the safe conduct of the local diving program.
3. Shall be guided in the performance of the required duties by the advice of the DCB, but operational responsibility for the conduct of the local diving program will be retained by the Diving Safety Officer.
4. Shall suspend diving operations considered to be unsafe or unwise.
5. Recommend and establish training programs through which applicants for scientific diving certification can satisfy the requirements of these Standards.
6. Prepare recommendations for consideration by the DCB, such as changes in policy, procedure, regulations, training programs, and equipment.

Diving Control Board

- The Diving Control Board (DCB) consists of a voting majority of active scientific divers. Voting members include the Associate Vice President for Academic Administration, the Director of Risk and Safety Management, the Diving Safety Officer, and other active scientific divers of the University community. Other non-voting representatives may be appointed or invited as needed. A chairperson and a secretary may be chosen from the membership of the board according to local procedure.
- Has autonomous and absolute authority over the scientific diving program’s operation.
- Shall meet at least twice each year.
Shall approve and monitor diving projects.
Shall review and revise the diving safety manual.
Shall assure compliance with the diving safety manual.
Shall certify the depths to which a diver has been trained.
Shall take disciplinary action for unsafe practices.
Shall assure adherence to the buddy system for scuba diving.
Shall act as the official representative of the University in matters concerning the scientific diving program.
Shall act as a board of appeal to consider diver-related problems.
Shall recommend the issue, reissue, or the revocation of diving certifications.
Shall recommend changes in policy and amendments to AAUS and the University’s diving safety manual as the need arises.
Shall establish and/or approve training programs through which the applicants for certification can satisfy the requirements of the University’s diving safety manual.
Shall suspend diving programs that are considered to be unsafe or unwise.
Shall establish criteria for equipment selection and use.
Shall recommend new equipment or techniques.
Shall establish and/or approve facilities for the inspection and maintenance of diving and associated equipment.
Shall ensure that the University’s air station(s) meet air quality standards as described in Section 3.60.
Shall yearly review the Diving Safety Officer’s performance and program.
Shall sit as a board of investigation to inquire into the nature and cause of diving accidents or violations of the University’s diving safety manual.

Instructional Personnel

Qualifications

All personnel involved in diving instruction under the auspices of the organizational member shall be qualified for the type of instruction being given.

Selection

Instructional personnel will be selected by the responsible administrative officer, or designee, who will solicit the advice of the DCB in conducting preliminary screening of applicants for instructional positions.

Lead Diver

For each dive, one individual shall be designated as the Lead Diver who shall be at the dive location during the diving operation. The Lead Diver shall be responsible for:

- Coordination with other known activities in the vicinity that are likely to interfere with diving operations.
• Ensuring all dive team members possess current certification and are qualified for the type of diving operation.
• Planning dives in accordance with Section 2.20
• Ensuring safety and emergency equipment is in working order and at the dive site.
• Briefing dive team members on:
  a) Dive objectives.
  b) Unusual hazards or environmental conditions likely to affect the safety of the diving operation.
  c) Modifications to diving or emergency procedures necessitated by the specific diving operation.
• Suspending diving operations if in their opinion conditions are not safe.
• Reporting to the DSO and DCB any physical problems or adverse physiological effects including symptoms of pressure-related injuries.

Reciprocity and Visiting Scientific Diver

Two or more AAUS Organizational Members 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.

A Scientific Diver from one Organizational Member shall apply for permission to dive under the auspices of another Organizational Member by submitting to the Diving Safety Officer of the host Organizational Member a document containing all the information described in Appendix 6, signed by the Diving Safety Officer or Chairperson of the home Diving Control Board.

A visiting Scientific Diver may be asked to demonstrate their knowledge and skills for the planned dive.

If a host Organizational Member denies a visiting Scientific Diver permission to dive, the host Diving Control Board shall notify the visiting Scientific Diver and their Diving Control Board with an explanation of all reasons for the denial.

Waiver of Requirements

The University’s Diving Control Board may grant a waiver for specific requirements of training, examinations, depth certification, and minimum activity to maintain certification.

1.30 Consequence of Violation of Regulations by Scientific Divers

Failure to comply with the regulations of the University’s diving safety manual may be cause for the revocation or restriction of the diver’s scientific diving certificate by action of the University’s Diving Control Board.

1.40 Consequences of Violation of Regulations by Walla Walla University

Failure to comply with the regulations of this standard may be cause for the revocation or restriction of Walla Walla University’s recognition by AAUS.
1.50 Record Maintenance

The Diving Safety Officer or designee shall maintain permanent records for each Scientific Diver certified. The file shall include evidence of certification level, log sheets, results of current physical examination, reports of disciplinary actions by the University’s Diving Control Board, and other pertinent information deemed necessary.

Availability of Records:

- Medical records shall be available to the attending physician of a diver or former diver when released in writing by the diver.
- Records and documents required by this standard shall be retained by the University for the following period:
  1. Physician’s written reports of medical examinations for dive team members - 5 years.
  2. Diving safety manual - current document only.
  3. Records of dive - 1 year, except 5 years where there has been an incident of pressure-related injury.
  4. Pressure-related injury assessment - 5 years.
  5. Equipment inspection and testing records - current entry or tag, or until equipment is withdrawn from service.
SECTION 2.00 DIVING REGULATIONS FOR SCUBA  
(OPEN CIRCUIT, COMPRESSED AIR)

2.10 Introduction

No person shall engage in scientific diving operations under the auspices of the Walla Walla University scientific diving program unless they hold a current scientific diving certification issued pursuant to the provisions of this standard.

2.20 Pre-Dive Procedures

Dive Plans

Dives should be planned around the competency of the least experienced diver. Before conducting any diving operations, the project leader or lead diver for a proposed operation must formulate a Dive Plan (Appendix 19) that should include the following:

- Divers’ qualifications and the type of certificate or certification held by each diver.
- Emergency plan (Appendices 7 and 15) 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 decompression chamber.
- Approximate number of proposed dives.
- Location(s) of proposed dives.
- Estimated depth(s) and bottom time(s) anticipated.
- Decompression status and repetitive dive plans, if required.
- Proposed work, equipment, and boats to be employed.
- Any hazardous conditions anticipated.

Pre-dive Safety Checks

Diver’s Responsibility:

1. Scientific divers shall conduct a functional check of their diving equipment in the presence of the diving buddy or tender.

2. It is the diver’s responsibility and duty to refuse to dive if, in their judgment, conditions are unfavorable, if they would be violating the precepts of their training, or if they would be violating the University’s Standards for Scientific Diving.

3. No dive team member shall be required to be exposed to hyperbaric conditions against their will, except when necessary to prevent or treat a pressure-related injury.

4. No dive team member shall be permitted to dive for the duration of any known condition which is likely to adversely affect the safety and health of the diver or other dive members.
Equipment Evaluations:

1. Divers shall ensure that their equipment is in proper working order and that the equipment is suitable for the type of diving operation.
2. Each diver shall have the capability of achieving and maintaining positive buoyancy.

Site Evaluation

1. Environmental conditions at the site will be evaluated.

2.30 Diving Procedures

Solo Diving Prohibition

All diving activities shall assure adherence to the buddy system for scuba diving. This buddy system is based upon mutual assistance, especially in the case of an emergency.

Dives Conducted from Vessels

All dives originating from a vessel shall include a dedicated vessel operator. The vessel operator shall be a responsible and capable adult (18 years of age or older), preferably with scuba experience. The vessel is to remain near the divers’ surface-exhaust bubbles and is to display a dive flag. Vessels will meet United States Coast Guard requirements for the size and type of vessel being used.

Refusal to Dive

The decision to dive is that of the diver. A diver may refuse to dive, without fear of penalty, whenever they feel it is unsafe for them to make the dive.

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 their judgment, conditions are unsafe or unfavorable, or if they would be violating the precepts of their training or the regulations in this standard.

Termination of the Dive

It is the responsibility of the diver to terminate the dive, without fear of penalty, whenever they feel it is unsafe to continue the dive, unless it compromises the safety of another diver already in the water.

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

Emergencies and Deviations from Regulations

Any diver may deviate from the requirements of this standard to the extent necessary to prevent or minimize a situation that is likely to cause death, serious physical harm, or major environmental damage. A written report of such actions must be submitted to the Diving Control Board explaining the circumstances and justifications.
2.40 Post-Dive Procedures

Post-Dive Safety Checks

After the completion of a dive, each diver shall report any physical problems, symptoms of decompression sickness, or equipment malfunctions.

When diving outside the no-decompression limits, the divers should remain awake for at least 1 hour after diving, and in the company of a dive team member who is prepared to transport them to a decompression chamber if necessary.

2.50 Emergency Procedures

The Diving Control Board has developed emergency procedures specific to the Pacific Northwest area of operation which follow the standards of care of the community and must include procedures for emergency care, recompression and evacuation for each dive location (Appendices 7 and 15).

Dives conducted outside the Pacific Northwest area of operation require the development of emergency procedures specific for the proposed area of operation. These emergency procedures will be included with the proposed Dive Plan (Appendix 19).

2.60 Flying After Diving or Ascending to Altitude (Over 1000 feet)

Following a Single No-Decompression Dive: Divers should have a minimum preflight surface interval of 12 hours.

Following Multiple Dives per Day or Multiple Days of Diving: Divers should have a minimum preflight surface interval of 18 hours.

Following Dives Requiring Decompression Stops: Divers should have a minimum preflight surface interval of 24 hours.

Before ascending to altitude above 1000 feet by land transport: Divers should follow the appropriate guideline for preflight surface intervals unless the decompression procedure used has accounted for the increase in elevation.

2.70 Record Keeping Requirements

Personal Diving Log

Each certified scientific diver shall log every dive made under the auspices of Walla Walla University, and is encouraged to log all other dives. Standard forms will be provided by the Diving Safety Officer. Log sheets shall be submitted to the Diving Safety Officer to be placed in the diver’s permanent file. Details of the submission procedures are left to the discretion of the Diving Safety Officer. Reciprocity divers must record their dives with their parent institution and provide copies to the University DSO. The diving log shall be in a form specified by the University and shall include at least the following:
• Name of diver, buddy, and Lead Diver.
• Date, time, and location.
• Diving modes used.
• General nature of diving activities.
• Approximate surface and underwater conditions.
• Maximum depths, bottom time, and surface interval time.
• Pre and post dive air pressures.
• Diving tables or computers used.
• Detailed report of any near or actual incidents.

Required Incident Reporting

All diving incidents requiring recompression treatment, or resulting in moderate or serious injury, or death shall be reported to the University’s Diving Control Board and the AAUS. The University’s regular procedures for incident reporting, including those required by the AAUS, shall be followed. The report will specify the circumstances of the incident and the extent of any injuries or illnesses.

Additional information must meet the following reporting requirements:
• The University shall record and report occupational injuries and illnesses in accordance with requirements of the appropriate Labor Code section.
• If pressure-related injuries are suspected, or if symptoms are evident, the following additional information shall be recorded and retained by the DSO, with the record of the dive, for a period of 5 years:
  2. Written descriptive report to include:
     • Name, address, phone numbers of the principal parties involved.
     • Summary of experience of divers involved.
     • Location, description of dive site, and description of conditions that led up to incident.
     • Description of symptoms, including depth and time of onset.
     • Description and results of treatment.
     • Disposition of case.
     • Recommendations to avoid repetition of incident.

The University shall investigate and document any incident of pressure-related injury and prepare a report that is to be forwarded to AAUS during the annual reporting cycle. This report must first be reviewed and released by the University’s Diving Control Board.
SECTION 3.00 DIVING EQUIPMENT

3.10 General Policy

All equipment shall meet standards as determined by the Diving Safety Officer and the Diving Control Board (Appendix 21). All equipment shall be regularly examined by the person using them. All scientific divers are expected to perform a basic inspection of their own and their buddy’s equipment prior to each dive.

The use of diving equipment other than open circuit SCUBA shall require written permission from the DSO or DCB.

Diving equipment shall be tested and serviced according to manufacturer recommendations. Equipment that is subjected to extreme usage under adverse conditions should require more frequent testing and maintenance.

3.20 Equipment

All equipment shall be tested on the schedule listed below, with records of testing, repair, and maintenance being sent to the DSO as required.

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*Regulators*

- Only those makes and models specifically approved by the Diving Safety Officer and the Diving Control Board shall be used (Appendix 21).
- Scuba regulators shall be inspected and tested prior to first use and every 12 months thereafter.
- Regulators will consist of a primary second stage and an alternate air source (such as an octopus second stage or redundant air supply).

*Breathing Masks and Helmets*

Breathing masks and helmets shall have:

- A non-return valve at the attachment point between helmet or mask and hose, which shall close readily and positively.
- An exhaust valve.
- A minimum ventilation rate capable of maintaining the diver at the depth to which they are diving.
**Scuba Cylinders**

- Scuba cylinders shall be designed, constructed, and maintained in accordance with the current Department of Transportation Regulations as outlined in CFR 49.
- Scuba cylinders must be hydrostatically tested in accordance with DOT standards.
- Scuba cylinders must have an internal and external inspection at intervals not to exceed 12 months.
- Scuba cylinder valves shall be functionally tested at intervals not to exceed 12 months.

**Backpacks**

- Backpacks without integrated flotation devices and weight systems shall have a quick release device designed to permit jettisoning with a single motion from either hand.

**Gauges**

- Gauges shall be inspected and tested before first use and every 12 months thereafter.

**Flotation Devices**

- Each diver must, by virtue of a buoyancy compensating device, have the capability of achieving and maintaining positive buoyancy with all of his or her gear.
- Buoyancy compensating devices are required for all dives by all divers, including divers wearing dry suits. The device must not interfere with the operation of the dry suit’s control valves.
- Personal flotation systems, buoyancy compensators, dry suits, or other variable volume buoyancy compensation devices shall be equipped with an exhaust valve.
- These devices shall be functionally inspected and tested at intervals not to exceed 12 months.

**Timing Devices, Depth, and Pressure Gauges**

- Both members of the buddy team must have an underwater timing device, an approved depth indicator, and a submersible pressure gauge.

**Dive Lights**

- For night dives each diver must have a primary light, a secondary (backup) light, and a tank/snorkel light.

**Cutting Device**

- Each diver must be equipped with a diver’s knife and/or EMT shears.

**Signaling Devices**

- Each diver must be equipped with a surface marker buoy.
- Each diver must be equipped with a surface auditory signaling device such as a whistle or scuba air horn.
Determination of Decompression Status: Dive Tables, Dive Computers

- A set of diving tables, approved by the Diving Control Board, must be available at the dive location.
- Dive computers may be utilized in place of diving tables, and must be approved by the Diving Control Board (Appendix 21). Divers using dive computers must demonstrate proficiency on the correct use of the specific unit being used to the DSO or DCB scientific diver member. AAUS recommendations on dive computers are located in Appendix 8.

3.30 Auxiliary Equipment

Hand held underwater power tools

- The use of surface-supplied electrical, pneumatic, and hydraulic hand held tools must be approved in writing by the DSO and DCB. Requests should be submitted with the Dive Plan (Appendix 19). Hand-held electrical tools and equipment used underwater shall be specifically designed 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 and tool on/off operation must be under the diver’s control.

Note: some tools and tool use may not be appropriate for scientific divers under the OSHA exemption for scientific diving.

3.40 Support Equipment

First aid supplies

- A first aid kit and emergency oxygen kit shall be available at all dive locations. All divers must be trained in the administration of first aid and oxygen for diving injuries, and be familiar with the use of the specific equipment at the dive location.

Diver’s Flag

- A diver’s flag shall be displayed prominently whenever diving is conducted under circumstances where required or where water traffic is probable.

Emergency Communications

A cell phone and a portable VHF radio shall be present at all dive locations.

Compressor Systems - University Controlled

Walla Walla University currently does not own, operate, or control a compressor system. If in the future the university owns, operates, or controls a compressor system the following standards will be followed.

The following will be considered in design and location of compressor systems:

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

Record Keeping

Each equipment modification, repair, test, calibration, or maintenance service shall be logged, including the date and nature of work performed, serial number of the item, and the name of the person/company performing the work for the following equipment:

- Regulators
- Submersible pressure gauges
- Depth gauges
- Scuba cylinders
- Cylinder valves
- Diving helmets
- Submersible breathing masks
- Compressors
- Gas control panels
- Air storage cylinders
- Air filtration systems
- Analytical instruments
- Buoyancy control devices
- Dry suits

Compressor Operation and Air Test Records

Walla Walla University currently does not own, operate, or control a compressor system. If in the future the university owns, operates, or controls a compressor system the following standards will be followed.

Gas analyses and air tests shall be performed on each University controlled breathing air compressor at regular intervals of no more than 100 hours of operation or 6 months, whichever occurs first. The results of these tests shall be entered in a formal log and be maintained.

A log shall be maintained showing operation, repair, overhaul, filter maintenance, and temperature adjustment for each compressor.
3.60 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).

<table>
<thead>
<tr>
<th>Component</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxygen</td>
<td>20 - 22%&lt;sub&gt;v&lt;/sub&gt;</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>10 PPM&lt;sub&gt;v&lt;/sub&gt;</td>
</tr>
<tr>
<td>Carbon Dioxide</td>
<td>1000 PPM&lt;sub&gt;v&lt;/sub&gt;</td>
</tr>
<tr>
<td>Condensed Hydrocarbons</td>
<td>5 mg/m&lt;sub&gt;3&lt;/sub&gt;</td>
</tr>
<tr>
<td>Total Hydrocarbons as Methane</td>
<td>25 PPM&lt;sub&gt;v&lt;/sub&gt;</td>
</tr>
<tr>
<td>Water Vapor ppm</td>
<td>(2)</td>
</tr>
<tr>
<td>Objectionable Odors</td>
<td>None</td>
</tr>
</tbody>
</table>

For breathing air used in conjunction with self-contained breathing apparatus in extreme cold where moisture can condense and freeze, causing the breathing apparatus to malfunction, a dew point not to exceed -50°F (63 pm v/v) or 10 degrees lower than the coldest temperature expected in the area is required.
SECTION 4.00  ENTRY-LEVEL TRAINING REQUIREMENTS

4.10 General Policy
Training and certification as an entry-level diver is a prerequisite to AAUS and Walla Walla University Scientific Diver Training. In lieu of writing/promulgating AAUS specific standards for entry-level divers, AAUS references here the standards for entry-level diver training as defined by the WRSTC and/or ISO. AAUS programs who wish to train entry-level divers may do so using one of the following options:

a) under the auspices and standards of an internationally recognized diver training agency.

b) under the auspices of AAUS using the minimum guidelines presented by the most current version of the RSTC/WRSTC and/or ISO entry-level diver standards.

Walla Walla University’s scientific diving training program follows option “a” above, and has the entry-level training requirement of Advanced Open Water Diver or equivalent from an internationally recognized training agency.

4.20 References
“Minimum Course Content for Open Water Diver Certification”- World Recreational Scuba Training Council (WRSTC), www.wrstc.com.

SECTION 5.00 SCIENTIFIC DIVER CERTIFICATION

This section describes the training and performance standards for Walla Walla University Scientific Divers, which include and may exceed the training and performance standards for AAUS Scientific Divers. These standards represent the minimum required level of knowledge and skills presented in a generalized format.

5.10 Prerequisites

Administrative

The applicant/candidate must complete all administrative and legal documentation required by these Standards for Scientific Diving.

Diver Certification

The applicant/candidate must, at minimum, show documented proof of Advanced Open Water Diver certification from an internationally recognized training agency.

Medical Examination

The applicant/candidate must be medically qualified for diving as described in Section 6.0 of these Standards for Scientific Diving.

Swimming/Watermanship Evaluation

The applicant/candidate must demonstrate the following in the presence of the Diving Safety Officer, instructor, or other approved examiner. All tests are to be performed without swim aids; however, where exposure protection is needed, the applicant must be appropriately weighted to provide for neutral buoyancy.

   a) Swim underwater for a distance of 25 yards/meters without surfacing.
   b) Swim 400 yards/meters in less than 12 minutes.
   c) Tread water for 10 minutes, or 2 minutes without the use of hands.
   d) Transport a passive person of equal size a distance of 25 yards/meters in the water.

5.20 Training

The diver must complete theoretical aspects and practical training for a minimum cumulative time of 100 hours following Open Water Diver certification. Theoretical aspects shall include principles and activities appropriate to the intended area of scientific study.

Theoretical Training/Knowledge Development

Required Topics:

1. Diving Emergency Care Training
   • Cardiopulmonary Resuscitation (CPR)
   • Standard or Basic First Aid
   • Recognition of DCS and AGE
   • Accident Management
   • Field Neurological Exam
• Oxygen Administration
2. Dive Rescue
3. Dive Physics
4. Dive Physiology
5. Dive Environments
6. Decompression Theory and its Application
7. AAUS Scientific Diving Regulations and History
   • Scientific Dive Planning
   • Coordination with other Agencies
   • Appropriate Governmental Regulations
8. Scientific Method
9. Data Gathering Techniques (Only Items specific to area of study required)
   • Transect Sampling (Quadrating)
   • Transecting
   • Mapping
   • Coring
   • Photography
   • Tagging
   • Collecting
   • Animal Handling
   • Archaeology
   • Common Biota
   • Organism Identification
   • Behavior
   • Ecology
   • Site Selection, Location, and Re-location
   • Specialized Equipment for data gathering
   • HazMat Training for the handling of HP Cylinders
   • Chemical Hygiene, Laboratory Safety (Use Of Chemicals)

Suggested Topics:
10. Specific Dive Modes (methods of gas delivery)
   • Open Circuit
   • Hooka
   • Surface Supplied diving
11. Small Boat Operation
12. Rebreathers
   • Closed
   • Semi-closed
13. Specialized Breathing Gas
   • Nitrox
   • Mixed Gas
14. Specialized Environments and Conditions
   • Blue Water Diving.
   • Ice and Polar Diving (Cold Water Diving)
   • Zero Visibility Diving
   • Polluted Water Diving
   • Saturation Diving
• Decompression Diving
• Overhead Environments
• Aquarium Diving
• Night Diving
• Kelp Diving
• Strong Current Diving (Live-boatng)
• Potential Entanglement

15. Specialized Diving Equipment
• Full face mask
• Dry Suit
• Communications

**Practical Training/ Skill Development**

**Confined Water Evaluation**
At the completion of training, the trainee must satisfy the Diving Safety Officer or the scientific diving training instructor of their ability to perform the following, as a minimum, in a pool or in sheltered water:

a) Enter water with full equipment.
b) Clear face mask.
c) 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.
d) Demonstrate ability to alternate between snorkel and scuba while kicking.
e) Demonstrate understanding of underwater signs and signals.
f) Demonstrate simulated in-water mouth-to-mouth resuscitation.
g) Rescue and transport, as a diver, a passive simulated victim of an accident.
h) Demonstrate ability to remove and replace equipment while submerged.
i) Demonstrate watermanship ability, which is acceptable to the instructor.

**Open Water Evaluation**
The trainee must satisfy the Diving Safety Officer of their ability to perform at least the following in open water:

a) Surface dive to a depth of 10 feet in open water without scuba.
b) Demonstrate proficiency in air sharing as both donor and receiver.
c) Enter and leave open water or surf, or leave and board a diving vessel, while wearing scuba gear.
d) Kick on the surface 400 yards while wearing scuba gear, but not breathing from the scuba unit.
e) Demonstrate judgment adequate for safe diving.
f) Demonstrate, where appropriate, the ability to maneuver efficiently in the environment, at and below the surface.
g) Complete a simulated emergency swimming ascent.
h) Demonstrate clearing of mask and regulator while submerged.
i) Demonstrate ability to achieve and maintain neutral buoyancy while submerged.
j) Demonstrate techniques of self-rescue and buddy rescue.
k) Navigate underwater.
l) Plan and execute a dive.

Checkout Dive/ Additional Experience

Practical training must include an Open Water checkout dive(s), with evaluation of the skills listed in Open Water Evaluation, with the DSO or qualified delegate followed by at least 11 ocean or open water dives in a variety of dive sites and diving conditions, for a cumulative bottom time of 6 hours. Dives following the checkout dive must be supervised by a certified Scientific Diver with experience in the type of diving planned, with the knowledge and permission of the DSO.

5.30 Examinations

Written Exams

Before completing training, the trainee must pass a written examination that demonstrates knowledge of at least the following:

1. Function, care, use, and maintenance of diving equipment.
2. Physics and physiology of diving.
3. Diving regulations and precautions.
5. Dangerous marine animals.
6. Emergency procedures, including buoyant ascent and ascent by air sharing.
7. Currently accepted decompression procedures.
8. Demonstrate the proper use of dive tables.
10. Aspects of freshwater and altitude diving.
11. Hazards of breath-hold diving and ascents.
12. Planning and supervision of diving operations.
14. Cause, symptoms, treatment, and prevention of the following: near drowning, air embolism, carbon dioxide excess, squeezes, oxygen poisoning, nitrogen narcosis, exhaustion and panic, respiratory fatigue, motion sickness, decompression sickness, hypothermia, and hypoxia/anoxia.
15. Suggested topics (from Sec. 5.20) at the DSO’s discretion.
Equipment

The trainee will be subject to examination/review of:

1. Personal diving equipment
2. Task specific equipment

5.40 Diver Permits/ Certifications

Walla Walla University requires that no person shall engage in scientific diving that is University-sponsored, occurs from University property, or involves University equipment unless that person is authorized by Walla Walla University pursuant to the provisions of these Standards. Only a person diving under the auspices of Walla Walla University that subscribes to the practices of AAUS is eligible for a scientific diver certification.

Scientific Diver-In-Training Permit

This is a permit to dive, usable only while it is current and for the purpose intended. This permit signifies that a diver has completed and been certified as at least an Advanced Open Water Diver through an internationally recognized certifying agency or scientific diving program, and has the knowledge skills and experience necessary to continue training as a scientific diver under supervision of a certified Scientific Diver, as approved by the DSO. Additional requirements as listed in section 5.20 include Diving Emergency Care Training, Confined Water Evaluation (except item f), and Open Water Evaluation (except item j).

Scientific Diver Certification

This permit signifies a diver has completed all requirements in Section 5.0 and is authorized by Walla Walla University to engage in scientific diving without supervision, as approved by the DSO. Submission of documents and participation in aptitude examinations does not automatically result in certification. The applicant must convince the Diving Safety Officer and members of the DCB that they are sufficiently skilled and proficient to be certified as a Walla Walla University Scientific Diver. This skill and proficiency will be acknowledged by the signature of the Diving Safety Officer. Any applicant who does not possess the necessary judgment, under diving conditions, for the safety of the diver and other divers, may be denied Walla Walla University scientific diving privileges.

5.50 Depth Certifications

Depth Certifications and Progression to Next Depth Level

A certified scientific diver diving under the auspices of Walla Walla University may progress to the next depth level after successfully completing the required dives for the next level. Under these circumstances the diver may exceed their currently certified depth limit. Dives shall be planned and executed under close supervision of a scientific diver certified to this depth, with the knowledge and permission of the DSO.
a) Certification to 30 Foot Depth - Initial permit level, approved upon the successful completion of training listed in Section 4.00 and 5.00.

b) Certification to 60 Foot Depth - A diver holding a 30 foot certificate may be certified to a depth of 60 feet after successfully completing, under supervision, 12 logged training dives to depths between 31 and 60 feet, for a minimum total time of 4 hours.

c) Certification to 100 Foot Depth - A diver holding a 60 foot certificate may be certified to a depth of 100 feet after successfully completing, 4 dives to depths between 61 and 100 feet. The diver shall also demonstrate proficiency in the use of the appropriate Dive Tables.

d) Certification to 130 Foot Depth - A diver holding a 100 foot certificate may be certified to a depth of 130 feet after successfully completing, 4 dives to depths between 100 and 130 feet. The diver shall also demonstrate proficiency in the use of the appropriate Dive Tables.

Walla Walla University Scientific Diving is not permitted beyond a depth of 130 feet.

5.60 Night Certification

Night diving presents special opportunities and challenges for scientific divers. Upon the successful completion of training and certification listed in 5.10-5.50, scientific divers are certified for daytime diving (sunrise to sunset). To be certified as a night diver (sunset to sunrise), scientific divers must perform the following with the knowledge and permission of the DSO:

a) Plan and execute a minimum of one night dive in a shallow/sheltered water environment to a maximum depth of 40 feet. This dive must be completed with a dive buddy who already holds a night diving certification. The diver shall be free of scientific tasks (besides simple observations) and extra equipment.

b) Plan and execute a minimum of two additional night dives to a maximum depth of 60 feet. These dives must be completed with a dive buddy who already holds a night diving certification. The diver shall be free of scientific tasks (besides simple observations) and extra equipment.

Divers unfamiliar with the dive site where a night dive will occur should conduct a day dive at that site prior to the night dive.

5.70 Continuation of Certification

Minimum Activity to Maintain Certification

During any 12-month period, each certified scientific diver must log a minimum of 12 dives. At least one dive must be logged near the maximum depth of the diver’s certification during each 6-month period. Divers certified to 130 feet or deeper may satisfy these requirements with dives to 100 feet or over. Failure to meet these requirements may be cause for revocation or restriction of certification.
Re-qualification of Depth Certificate

Once the initial certification requirements of Section 5.00 are met, divers whose depth certification has lapsed due to lack of activity may be re-qualified by procedures adopted by the DCB.

Medical Examination

All certified scientific divers shall pass a medical examination at the intervals specified in Section 6.0. After each major illness or injury, as described in Section 6.0, a certified scientific diver shall receive clearance to return to diving from a physician and the DSO before resuming diving activities. If the injury or illness is pressure related, the clearance to return to diving must come from a physician trained in diving medicine and the DSO.

Emergency Care Training

The scientific diver must provide proof of training in the following:

- Adult CPR (must be current)
- Adult AED (must be current)
- Emergency oxygen administration (must be current)
- First aid for diving accidents (must be current)

5.80  Revocation of Certification

A diving certificate may be revoked or restricted for cause by the DSO or the DCB. Violations of regulations set forth in this standard, or other governmental subdivisions not in conflict with this standard, may be considered cause. The DSO shall inform the diver in writing of the reason(s) for revocation. The diver will be given the opportunity to present their case to the DCB in writing for reconsideration and/or re-certification. All such written statements and requests, as identified in this section, are formal documents, which will become part of the diver’s file.

5.90  Recertification

If a diver’s certificate expires or is revoked, they may be re-certified after complying with such conditions as the DSO or the DCB may impose. The diver shall be given an opportunity to present their case to the DCB before conditions for re-certification are stipulated.

5.100  Waiver of Requirements/Temporary Diver

A temporary diver permit constitutes a waiver of the requirements of Section 5.0 and is issued only following a demonstration of the required proficiency in diving. It is valid only for a limited time, as determined by the DSO. This permit is not to be construed as a mechanism to circumvent existing standards set forth in this standard.

Requirements of Section 5.0 may be waived by the DSO if the person in question has demonstrated proficiency in diving and can contribute measurably to a planned dive. A statement of the temporary diver’s qualifications shall be submitted to the DSO as a part of the dive plan. Temporary permits shall be restricted to the planned diving operation and shall comply with all other policies, regulations, and standards of this standard, including medical requirements.
SECTION 6.00 MEDICAL STANDARDS

6.10 Medical Requirements

General

• Walla Walla University shall determine that divers have passed a current diving physical examination and have been declared by the examining physician to be fit to engage in diving activities as may be limited or restricted in the medical evaluation report.

• All medical evaluations required by this standard shall be performed by, or under the direction of, a licensed physician of the applicant-diver’s choice, preferably one trained in diving/undersea medicine.

• The diver should be free of any chronic disabling disease and any conditions contained in the list of conditions for which restrictions from diving are generally recommended. (Appendix 1)

6.20 Frequency of Medical Evaluations

Medical evaluation shall be completed:

1. Before a diver may begin scientific diving or scientific diving evaluation/training, unless an equivalent initial medical evaluation has been given within the preceding 5 years (3 years if over the age of 40, 2 years if over the age of 60), the DSO has obtained the results of that examination, and those results have been reviewed and found satisfactory by the DSO.

2. Thereafter, at 5 year intervals up to age 40, every 3 years after the age of 40, and every 2 years after the age of 60.

3. Clearance to return to diving must be obtained from a physician following any major injury or illness, or any condition requiring hospital care or chronic medication. If the injury or illness is pressure related, then the clearance to return to diving must come from a physician trained in diving medicine.

6.30 Information Provided Examining Physician

The DSO shall provide a copy of the medical evaluation requirements of this standard to the scientific diver or scientific diver applicant, who shall provide a copy to the examining physician. (Appendices 1, 2, and 3).

6.40 Content of Medical Evaluations

Medical examinations conducted initially and at the intervals specified in Section 6.10 shall consist of the following:

1. Applicant agreement for release of medical information to the Diving Safety Officer and the DCB (Appendix 2b).

2. Medical history (Appendix 3).

3. Diving physical examination (Required tests listed below and in Appendix 2).
6.50 **Conditions Which May Disqualify Candidates From Diving** (Adapted from Bove, 1998)

- a) Abnormalities of the tympanic membrane, such as perforation, presence of a monomeric membrane, or inability to auto inflate the middle ears.
- b) Hearing loss; Vertigo including Meniere’s Disease.
- c) Stapedectomy or middle ear reconstructive surgery.
- d) Recent ocular surgery.
- e) Psychiatric disorders including claustrophobia, suicidal ideation, psychosis, anxiety states, depression.
- f) Substance abuse, including alcohol.
- g) Episodic loss of consciousness.
- h) History of seizure.
- i) History of stroke or a fixed neurological deficit.
- j) Recurring neurologic disorders, including transient ischemic attacks.
- k) History of intracranial aneurysm, other vascular malformation or intracranial hemorrhage.
- l) History of neurological decompression illness with residual deficit.
- m) Head injury.
- n) Hematologic disorders including coagulopathies.
- o) Risk factors or evidence of coronary artery disease.
- p) Atrial septal defects.
- q) Significant valvular heart disease - isolated mitral valve prolapse is not disqualifying.
- r) Significant cardiac rhythm or conduction abnormalities.
- s) Implanted cardiac pacemakers and cardiac defibrillators (ICD).
- t) Inadequate exercise tolerance.
- u) Hypertension.
- v) History of pneumothorax.
- w) Asthma.
- x) Chronic pulmonary disease, including radiographic evidence of pulmonary blebs, bullae or cysts.
- y) Diabetes mellitus.
- z) Pregnancy.

6.60 **Laboratory Requirements for Diving Medical Evaluation and Intervals**

*Initial examination under age 40:*

1. Medical History
2. Complete Physical Exam, emphasis on neurological and otological components
3. Urinalysis
4. Any further tests deemed necessary by the physician.

*Periodic re-examination under age 40 (every 5 years):*

1. Medical History
2. Complete Physical Exam, emphasis on neurological and otological components
3. Urinalysis
4. Any further tests deemed necessary by the physician
First exam over age 40:

1. Medical History
2. Complete Physical Exam, emphasis on neurological and otological components
3. Detailed assessment of coronary artery disease risk factors using Multiple-Risk-Factor Assessment\(^1\,\,^2\) (age, family history, lipid profile, blood pressure, diabetic screening, smoking history). Further cardiac screening may be indicated based on risk factor assessment.
4. Resting EKG
5. Chest X-ray
6. Urinalysis
7. Any further tests deemed necessary by the physician

Periodic re-examination over age 40 (every 3 years); over age 60 (every 2 years):

1. Medical History
2. Complete Physical Exam, emphasis on neurological and otological components
3. Detailed assessment of coronary artery disease risk factors using Multiple-Risk-Factor Assessment\(^1\) (age, family history, lipid profile, blood pressure, diabetic screening, smoking history). Further cardiac screening may be indicated based on risk factor assessment.
4. Resting EKG
5. Urinalysis
6. Any further tests deemed necessary by the physician

6.70 Physician’s Written Report

After any medical examination relating to the individual’s fitness to dive, Walla Walla University shall be provided a written report prepared by the examining physician that shall contain the examining physician’s opinion of the individual’s fitness to dive, including any recommended restrictions or limitations. This report will be reviewed by the DSO and placed in the diver’s file.

Walla Walla University shall make a copy of the physician’s written report available to the individual upon request by the individual.

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SECTION 7.00 NITROX DIVING GUIDELINES

The following guidelines address the use of nitrox by scientific divers under the auspices of Walla Walla University. Nitrox is defined for these guidelines as breathing mixtures composed predominately of nitrogen and oxygen, most commonly produced by the addition of oxygen or the removal of nitrogen from air.

7.10 Prerequisites

Eligibility

Only a certified Scientific Diver or Scientific Diver In Training (Sections 4.00 and 5.00) diving under the auspices of Walla Walla University is eligible for authorization to use nitrox. After completion, review and acceptance of application materials, training and qualification, an applicant will be authorized to use nitrox within their depth authorization, as specified in Section 5.50.

Application and Documentation

Application and documentation for authorization to use nitrox should be made by completing the Nitrox Authorization Form (Appendix 17) and submitting it along with copies of nitrox certification cards or verification of nitrox training to the DSO for review.

7.20 Requirements for Authorization to Use Nitrox

Submission of documents and participation in aptitude examinations does not automatically result in authorization to use nitrox. The applicant must convince the DSO and members of the DCB that they are sufficiently skilled and proficient. The signature of the DSO on the Nitrox Authorization Form will acknowledge authorization. After completion of training and evaluation, authorization to use nitrox may be denied to any diver who does not demonstrate to the satisfaction of the DSO or DCB the appropriate judgment or proficiency to ensure the safety of the diver and dive buddy.

Prior to authorization to use nitrox, the following minimum requirements should be met:

1. Training

   The diver must complete additional theoretical and practical training beyond the Scientific Diver In Training air certification level, to the satisfaction of the member organizations DSO and DCB (Section 7.30).

2. Examinations

   Each diver should demonstrate proficiency in skills and theory in written, oral, and practical examinations covering:
   - Written examinations covering the information presented in the classroom training session(s) (i.e., gas theory, oxygen toxicity, partial pressure determination, etc.)
   - Practical examinations covering the information presented in the practical training session(s) (i.e., gas analysis, documentation procedures, etc.)
   - Open water checkout dives, to appropriate depths, to demonstrate the application of theoretical and practical skills learned.
Minimum Activity to Maintain Authorization

The diver should log at least one nitrox dive per year. Failure to meet the minimum activity level may be cause for restriction or revocation of nitrox authorization.

7.30 Nitrox Training Guidelines

Training in these guidelines should be in addition to training for Diver-In-Training authorization (Section 4.00). It may be included as part of training to satisfy the Scientific Diver training requirements (Section 5.00), or may occur through an internationally recognized scuba training organization.

Classroom Instruction

Topics should include, but are not limited to: review of previous training; physical gas laws pertaining to nitrox; partial pressure calculations and limits; equivalent air depth (EAD) concept and calculations; oxygen physiology and oxygen toxicity; calculation of oxygen exposure and maximum safe operating depth (MOD); determination of decompression schedules (both by EAD method using approved air dive tables, and using approved nitrox dive tables); dive planning and emergency procedures; mixing procedures and calculations; gas analysis; personnel requirements; equipment marking and maintenance requirements; dive station requirements.

The DCB may choose to limit standard nitrox diver training to procedures applicable to diving, and subsequently reserve training such as nitrox production methods, oxygen cleaning, and dive station topics to divers requiring specialized authorization in these areas.

Practical Training

The practical training portion will consist of a review of skills as stated for scuba (Section 5.00), with additional training as follows:

- Oxygen analysis of nitrox mixtures.
- Determination of MOD, oxygen partial pressure exposure, and oxygen toxicity time limits, for various nitrox mixtures at various depths.
- Determination of nitrogen-based dive limits status by EAD method using air dive tables, and/or using nitrox dive tables, as approved by the DCB.
- Nitrox dive computer use may be included, as approved by the DCB.

Written Examination (based on classroom instruction and practical training)

Before authorization, the trainee should successfully pass a written examination demonstrating knowledge of at least the following:

- Function, care, use, and maintenance of equipment cleaned for nitrox use.
- Physical and physiological considerations of nitrox diving (ex.: O₂ and CO₂ toxicity).
- Diving regulations and procedures as related to nitrox diving, either scuba or surface-supplied (depending on intended mode).
- Given the proper information, calculation of:
- Equivalent air depth (EAD) for a given fO2 and actual depth;
- pO2 exposure for a given fO2 and depth;
- Optimal nitrox mixture for a given pO2 exposure limit and planned depth;
- Maximum operational depth (MOD) for a given mix and pO2 exposure limit;
- For nitrox production purposes, percentages/psi of oxygen present in a given mixture, and psi of each gas required to produce a fO2 by partial pressure mixing.

- Dive table and dive computer selection and usage.
- Nitrox production methods and considerations.
- Oxygen analysis.
- Nitrox operational guidelines (Section 7.40), dive planning, and dive station components.

Open water Dives

A minimum of two supervised open water dives using nitrox is required for authorization. The mode used in the dives should correspond to the intended application (i.e., scuba or surface-supplied). If the MOD for the mix being used can be exceeded at the training location, direct, in-water supervision is required.

Surface-Supplied Training

All training as applied to surface-supplied diving (practical, classroom, and open water) will follow the University’s surface-supplied diving standards, including additions listed in Section 11.60.

Walla Walla University and its Scientific Diving program do not practice, support, or provide surface-supplied diving or training.

7.40 Scientific Nitrox Diving Regulations

Dive Personnel Requirements

- Nitrox Diver In Training - A Scientific Diver In Training, who has completed the requirements of Section 4.00 and the training and authorization sections of these guidelines, may be authorized by the DSO to use nitrox under the direct supervision a Scientific Diver who also holds nitrox authorization. Dive depths should be restricted to those specified in the diver’s authorization, as described in Section 5.50.

- Scientific Diver - A Scientific Diver who has completed the requirements of Section 5.00 and the training and authorization sections of these guidelines, may be authorized by the DSO to use nitrox. Depth authorization to use nitrox should be the same as those specified in the diver’s authorization, as described in Section 5.50.

- Lead Diver - On any dive during which nitrox will be used by any team member, the Lead Diver should be authorized to use nitrox, and hold appropriate authorizations required for the dive, as specified in AAUS Standards. Lead Diver authorization for nitrox dives by the DSO and/or DCB should occur as part of the dive plan approval process.

In addition to responsibilities listed in Section 1.20, the Lead Diver should:

1. As part of the dive planning process, verify that all divers using nitrox on a dive are properly qualified and authorized;
2. As part of the pre-dive procedures, confirm with each diver the nitrox mixture the diver is using, and establish dive team maximum depth and time limits, according to the shortest time limit or shallowest depth limit among the team members.

3. The Lead Diver should also reduce the maximum allowable pO2 exposure limit for the dive team if on-site conditions so indicate (see “Oxygen Exposure Limits” below”).

Dive Parameters

Oxygen Exposure Limits

- The inspired oxygen partial pressure experienced at depth should not exceed 1.6 ATA. All dives performed using nitrox breathing mixtures should comply with the current NOAA Diving Manual “Oxygen Partial Pressure Limits for ‘Normal’ Exposures”.

- The maximum allowable exposure limit should be reduced in cases where cold or strenuous dive conditions, or extended exposure times are expected. The DCB should consider this in the review of any dive plan application, which proposes to use nitrox. The Lead Diver should also review on-site conditions and reduce the allowable pO2 exposure limits if conditions indicate.

- If using the equivalent air depth (EAD) method the maximum depth of a dive should be based on the oxygen partial pressure for the specific nitrox breathing mix to be used.

Bottom Time Limits

- Maximum bottom time should be based on the depth of the dive and the nitrox mixture being used.

- Bottom time for a single dive should not exceed the NOAA maximum allowable “Single Exposure Limit” for a given oxygen partial pressure, as listed in the current NOAA Diving Manual.

Dive Tables and Gases

- A set of DCB approved nitrox dive tables should be available at the dive site.

- When using the equivalent air depth (EAD) method, dives should be conducted using air dive tables approved by the DCB.

- If nitrox is used to increase the safety margin of air-based dive tables, the MOD and oxygen exposure and time limits for the nitrox mixture being dived should not be exceeded.

- Breathing mixtures used while performing in-water decompression, or for bail-out purposes, should contain the same or greater oxygen content as that being used during the dive, within the confines of depth limitations and oxygen partial pressure limits set forth in Section 7.40 Dive Parameters. Walla Walla University and its Scientific Diving program do not practice, support, or provide training for in-water decompression.

Nitrox Dive Computers

- Dive computers may be used to compute decompression status during nitrox dives. Manufacturers’ guidelines and operations instructions should be followed.

- Use of Nitrox dive computers should comply with dive computer guidelines included in Appendix 8.

- Nitrox dive computer users should demonstrate a clear understanding of the display, operations, and manipulation of the unit being used for nitrox diving prior to using the computer, to the
satisfaction of the DSO or designee.

• If nitrox is used to increase the safety margin of an air-based dive computer, the MOD and oxygen exposure and time limits for the nitrox mixture being dived shall not be exceeded.

• Dive computers capable of pO2 limit and fO2 adjustment should be checked by the diver prior to the start each dive to assure compatibility with the mix being used.

Repetitive Diving

• Repetitive dives using nitrox mixtures should be performed in compliance with procedures required of the specific dive tables used.

• Residual nitrogen time should be based on the EAD for the specific nitrox mixture to be used on the repetitive dive, and not that of the previous dive.

• The total cumulative exposure (bottom time) to a partial pressure of oxygen in a given 24 hour period should not exceed the current NOAA Diving Manual 24-hour Oxygen Partial Pressure Limits for “Normal” Exposures.

• When repetitive dives expose divers to different oxygen partial pressures from dive to dive, divers should account for accumulated oxygen exposure from previous dives when determining acceptable exposures for repetitive dives. Both acute (CNS) and chronic (pulmonary) oxygen toxicity concerns should be addressed.

Oxygen Parameters

• Authorized Mixtures - Mixtures meeting the criteria outlined in Section 7.40 may be used for nitrox diving operations, upon approval of the DCB.

• Purity - Oxygen used for mixing nitrox-breathing gas should meet the purity levels for “Medical Grade” (U.S.P.) or “Aviator Grade” standards.

• In addition to the AAUS Air Purity Guidelines (Section 3.60), the following standard should be met for breathing air that is either:
  
a) Placed in contact with oxygen concentrations greater than 40%.

  b) Used in nitrox production by the partial pressure mixing method with gas mixtures containing greater than 40% oxygen as the enriching agent.

<table>
<thead>
<tr>
<th>Air Purity:</th>
<th>CGA Grade E (Section 3.60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condensed Hydrocarbons</td>
<td>5mg/m³</td>
</tr>
<tr>
<td>Hydrocarbon Contaminants</td>
<td>No greater than 0.1 mg/m³</td>
</tr>
</tbody>
</table>
Gas Mixing and Analysis

**Walla Walla University and its Scientific Diving program do not operate or maintain compressor/filtration systems, fill stations, or produce nitrox mixtures.**

**Personnel Requirements**

a) Individuals responsible for producing and/or analyzing nitrox mixtures should be knowledgeable and experienced in all aspects of the technique.

b) Only those individuals approved by the DSO and/or DCB should be responsible for mixing and/or analyzing nitrox mixtures.

**Production Methods**

It is the responsibility of the DCB to approve the specific nitrox production method used.

**Analysis Verification by User**

a) It is the responsibility of each diver to analyze prior to the dive the oxygen content of his/her scuba cylinder and acknowledge in writing the following information for each cylinder: fO₂, MOD, cylinder pressure, date of analysis, and user’s name.

b) Individual dive log reporting forms should report fO₂ of nitrox used, if different than 21%.

### 7.50 Nitrox Diving Equipment

All of the designated equipment and stated requirements regarding scuba equipment required in the AAUS Standards should apply to nitrox scuba operations. Additional minimal equipment necessary for nitrox diving operations includes:

- Labeled SCUBA Cylinders
- Oxygen Analyzers

**Oxygen Cleaning and Maintenance Requirements**

**Requirement for Oxygen Service**

a) All equipment, which during the dive or cylinder filling process is exposed to concentrations greater than 40% oxygen at pressures above 150 psi, should be cleaned and maintained for oxygen service.

b) Equipment used with oxygen or mixtures containing over 40% by volume oxygen shall be designed and maintained for oxygen service. Oxygen systems over 125 psig shall have slow-opening shut-off valves. This should include the following equipment: scuba cylinders, cylinder valves, scuba and other regulators, cylinder pressure gauges, hoses, diver support equipment, compressors, and fill station components and plumbing.

**Scuba Cylinder Identification Marking**

Scuba cylinders to be used with nitrox mixtures should have the following identification documentation affixed to the cylinder.

a) Cylinders should be marked “NITROX”, or “EANx”, or “Enriched Air”.
b) Nitrox identification color-coding should include a 4-inch wide green band around the cylinder, starting immediately below the shoulder curvature. If the cylinder is not yellow, the green band should be bordered above and below by a 1-inch yellow band.

c) 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.

d) Other markings, which identify the cylinder as containing gas mixes other than Air, may be used as the approval of the DCB.A contents label should be affixed, to include the current fO2, date of analysis, and MOD.

e) The cylinder should be labeled to indicate whether the cylinder is prepared for oxygen or nitrox mixtures containing greater than 40% oxygen.

Regulators
Regulators to be used with nitrox mixtures containing greater than 40% oxygen should be cleaned and maintained for oxygen service, and marked in an identifying manner.

Other Support Equipment
a) An oxygen analyzer is required which is capable of determining the oxygen content in the scuba cylinder. Two analyzers are recommended to reduce the likelihood of errors due to a faulty analyzer. The analyzer should be capable of reading a scale of 0 to 100% oxygen, within 1% accuracy.

b) All diver and support equipment should be suitable for the fO2 being used.

Compressor system
a) Compressor/filtration system must produce oil-free air.

b) An oil-lubricated compressor placed in service for a nitrox system should be checked for oil and hydrocarbon contamination at least quarterly.

Fill Station Components
All components of a nitrox fill station that will contact nitrox mixtures containing greater than 40% oxygen should be cleaned and maintained for oxygen service. This includes cylinders, whips, gauges, valves, and connecting lines.
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TO THE EXAMINING PHYSICIAN:

This person, __________________________, requires a medical examination to assess their fitness for certification as a Scientific Diver for Walla Walla University. Their answers on the Diving Medical History Form (attached) may indicate potential health or safety risks as noted. Your evaluation is requested on the attached scuba Diving Fitness Medical Evaluation Report. If you have questions about diving medicine, you may wish to consult one of the references on the attached list or contact one of the physicians with expertise in diving medicine whose names and phone numbers appear on an attached list, the Undersea Hyperbaric and Medical Society, or the Divers Alert Network. Please contact the undersigned Diving Safety Officer if you have any questions or concerns. Thank you for your assistance.

______________________________________   _____________________________
Diving Safety Officer Signature               Date

James R. Nestler, Ph.D.
Office: 509-527-2551
Cell: 509-540-9984
jim.nestler@wallawalla.edu

Scuba and other modes of compressed-gas diving can be strenuous and hazardous. A special risk is present if the middle ear, sinuses, or lung segments do not readily equalize air pressure changes. The most common cause of distress is Eustachian insufficiency. Recent deaths in the scientific diving community have been attributed to cardiovascular disease. Please consult the following list of conditions that usually restrict candidates from diving.

(Adapted from Bove, 1998: bracketed numbers are pages in Bove)

CONDITIONS WHICH MAY DISQUALIFY CANDIDATES FROM DIVING
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 sequela. [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]

SELECTED REFERENCES IN DIVING MEDICINE

Available from Best Publishing Company, P.O. Box 30100, Flagstaff, AZ 86003-0100, the Divers Alert Network (DAN) or the Undersea and Hyperbaric Medical Society (UHMS), Durham, NC

MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT

Name of Applicant (Print or Type) ___________________________ Date of Medical Evaluation (Month/Day/Year)

To The Examining Physician: Scientific divers require periodic scuba diving medical examinations to assess their fitness to engage in diving with self-contained underwater breathing apparatus (scuba). Their answers on the Diving Medical History Form may indicate potential health or safety risks as noted. Scuba diving is an activity that puts unusual stress on the individual in several ways. Your evaluation is requested on this Medical Evaluation form. 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 (see references, following page). An absolute requirement is the ability of the lungs, middle ears and sinuses to equalize pressure. Any condition that risks the loss of consciousness should disqualify the applicant. Please proceed in accordance with the Walla Walla University Medical Standards (Sec. 6.00). If you have questions about diving medicine, please consult with the Undersea Hyperbaric Medical Society or Divers Alert Network.

TESTS: THE FOLLOWING TESTS ARE REQUIRED:

DURING INITIAL EXAMS (ALL AGES) AND PERIODIC RE-EXAMS (UNDER AGE 40):
- Medical history
- Complete physical exam, with emphasis on neurological and otological components
- Urinalysis
- Any further tests deemed necessary by the physician

AGE 40 AND OVER - ADDITIONAL TESTS DURING INITIAL EXAM AND PERIODIC RE-EXAMS
- Chest X-ray (required only during initial exam age 40 and over)
- Resting EKG
- Urinalysis
- Assessment of coronary artery disease using Multiple-Risk-Factor Assessment¹
  (age, lipid profile, blood pressure, diabetic screening, smoking)
  Note: Exercise stress testing may be indicated based on Multiple-Risk-Factor Assessment²

PHYSICIAN’S STATEMENT:

___ Diver IS medically qualified to dive for (check one):

    □ 2 years (over age 60)
    □ 3 years (age 40-59)
    □ 5 years (under age 40)

___ Diver IS NOT medically qualified to dive:_______________Permanently_______Temporarily

I have evaluated the abovementioned individual according to the Walla Walla University medical standards and required tests for scientific diving (Sec. 6.00) and, in my opinion, find no medical conditions that may be disqualifying for participation in scuba diving. I have discussed with the patient any medical condition(s) that would not disqualify him/her from diving but which may seriously compromise subsequent health. The patient understands the nature of the hazards and the risks involved in diving with these conditions.

_________________________________________________________ MD or DO _______________________________
Signature                                                                                           Date

_____________________________________________________________________________________________
Name (Print or Type)

_____________________________________________________________________________________________
Address

_____________________________________________________________________________________________
Telephone Number                     E-Mail Address

My familiarity with applicant is: _____This exam only    _____Regular physician for _____ years

My familiarity with diving medicine is:

_________________________________________________________
APPENDIX 2b
APPLICANT’S RELEASE OF MEDICAL INFORMATION FORM
MEDICAL EVALUATION OF FITNESS FOR SCUBA DIVING REPORT

APPLICANT'S RELEASE OF MEDICAL INFORMATION FORM

__________________________________________________________
Name of Applicant (Print or Type)

I authorize the release of this information and all medical information subsequently acquired in association with my diving to the Walla Walla University Diving Safety Officer and Diving Control Board or their designee at Walla Walla University.

Signature of Applicant ____________________________    Date ______________

REFERENCES

DIVING MEDICAL HISTORY FORM
(To Be Completed By Applicant-Diver)

Name ______________________________________   Sex ____ Age ___  Wt._____ Ht._____  

Sponsor: Walla Walla University   Date ___/___/___  
(Mo/Day/Yr)

TO THE APPLICANT:
Scuba diving places considerable physical and mental demands on the diver. Certain medical and physical requirements must be met before beginning a diving or training program. Your accurate answers to the questions are more important, in many instances, in determining your fitness to dive than what the physician may see, hear or feel as part of the diving medical certification procedure.
This form shall be kept confidential by the examining physician and Walla Walla University. 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 who 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, their 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 they are concerned only with your well-being and safety.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Please indicate whether or not the following apply to you</th>
<th>Comments</th>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td>Convulsions, seizures, or epilepsy</td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td>Fainting spells or dizziness</td>
<td></td>
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<td>3</td>
<td></td>
<td>Been addicted to drugs</td>
<td></td>
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<tr>
<td>4</td>
<td></td>
<td>Diabetes</td>
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<tr>
<td>5</td>
<td></td>
<td>Motion sickness or sea/air sickness</td>
<td></td>
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<td>6</td>
<td></td>
<td>Claustrophobia</td>
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<td>7</td>
<td></td>
<td>Mental disorder or nervous breakdown</td>
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<td>8</td>
<td></td>
<td>Are you pregnant?</td>
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<td>9</td>
<td></td>
<td>Do you suffer from menstrual problems?</td>
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<td>10</td>
<td></td>
<td>Anxiety spells or hyperventilation</td>
<td></td>
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<td>11</td>
<td></td>
<td>Frequent sour stomachs, nervous stomachs or vomiting spells</td>
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<td>12</td>
<td></td>
<td>Had a major operation</td>
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<td>13</td>
<td></td>
<td>Presently being treated by a physician</td>
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<td>14</td>
<td></td>
<td>Taking any medication regularly (even non-prescription)</td>
<td></td>
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<tr>
<td>15</td>
<td></td>
<td>Been rejected or restricted from sports</td>
<td></td>
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<tr>
<td>16</td>
<td></td>
<td>Headaches (frequent and severe)</td>
<td></td>
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<td>17</td>
<td></td>
<td>Wear dental plates</td>
<td></td>
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<td>18</td>
<td></td>
<td>Wear glasses or contact lenses</td>
<td></td>
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<tr>
<td>19</td>
<td></td>
<td>Bleeding disorders</td>
<td></td>
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<td>20</td>
<td></td>
<td>Alcoholism</td>
<td></td>
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<tr>
<td>21</td>
<td></td>
<td>Any problems related to diving</td>
<td></td>
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<tr>
<td>22</td>
<td></td>
<td>Nervous tension or emotional problems</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Condition</td>
<td>Comments</td>
<td></td>
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<td>---------------------------------------------------------------------------</td>
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<tr>
<td>23</td>
<td>Take tranquilizers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Perforated ear drums</td>
<td></td>
<td></td>
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<tr>
<td>25</td>
<td>Hay fever</td>
<td></td>
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<td>26</td>
<td>Frequent sinus trouble, frequent drainage from the nose, post-nasal drip, or stuffy nose</td>
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<tr>
<td>27</td>
<td>Frequent earaches</td>
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<tr>
<td>28</td>
<td>Drainage from the ears</td>
<td></td>
<td></td>
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<tr>
<td>29</td>
<td>Difficulty with your ears in airplanes or on mountains</td>
<td></td>
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<tr>
<td>30</td>
<td>Ear surgery</td>
<td></td>
<td></td>
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<tr>
<td>31</td>
<td>Ringing in your ears</td>
<td></td>
<td></td>
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<tr>
<td>32</td>
<td>Frequent dizzy spells</td>
<td></td>
<td></td>
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<tr>
<td>33</td>
<td>Hearing problems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Trouble equalizing pressure in your ears</td>
<td></td>
<td></td>
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<tr>
<td>35</td>
<td>Asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Wheezing attacks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Cough (chronic or recurrent)</td>
<td></td>
<td></td>
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<tr>
<td>38</td>
<td>Frequently raise sputum</td>
<td></td>
<td></td>
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<tr>
<td>39</td>
<td>Pleurisy</td>
<td></td>
<td></td>
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<tr>
<td>40</td>
<td>collapsed lung (pneumothorax)</td>
<td></td>
<td></td>
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<tr>
<td>41</td>
<td>Lung cysts</td>
<td></td>
<td></td>
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<tr>
<td>42</td>
<td>Pneumonia</td>
<td></td>
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<tr>
<td>43</td>
<td>Tuberculosis</td>
<td></td>
<td></td>
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<tr>
<td>44</td>
<td>Shortness of breath</td>
<td></td>
<td></td>
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<tr>
<td>45</td>
<td>Lung problem or abnormality</td>
<td></td>
<td></td>
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<tr>
<td>46</td>
<td>Spit blood</td>
<td></td>
<td></td>
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<td>47</td>
<td>Breathing difficulty after eating particular foods, after exposure to particular pollens or animals</td>
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<tr>
<td>48</td>
<td>Are you subject to bronchitis</td>
<td></td>
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<tr>
<td>49</td>
<td>Subcutaneous emphysema (air under the skin)</td>
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<tr>
<td>50</td>
<td>Air embolism after diving</td>
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<tr>
<td>51</td>
<td>Decompression sickness</td>
<td></td>
<td></td>
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<td>52</td>
<td>Rheumatic fever</td>
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<tr>
<td>53</td>
<td>Scarlet fever</td>
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<td>54</td>
<td>Heart murmur</td>
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<td></td>
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<tr>
<td>55</td>
<td>Large heart</td>
<td></td>
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<tr>
<td>56</td>
<td>High blood pressure</td>
<td></td>
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<tr>
<td>57</td>
<td>Angina (heart pains or pressure in the chest)</td>
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<tr>
<td>58</td>
<td>Heart attack</td>
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<td>Yes</td>
<td>No</td>
<td>Please indicate whether or not the following apply to you</td>
<td>Comments</td>
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<td>59</td>
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<td>Low blood pressure</td>
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<td>60</td>
<td></td>
<td>Recurrent or persistent swelling of the legs</td>
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<tr>
<td>61</td>
<td></td>
<td>Pounding, rapid heartbeat or palpitations</td>
<td></td>
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<tr>
<td>62</td>
<td></td>
<td>Easily fatigued or short of breath</td>
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<td>63</td>
<td></td>
<td>Abnormal EKG</td>
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<td>64</td>
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<td>Joint problems, dislocations or arthritis</td>
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<td>65</td>
<td></td>
<td>Back trouble or back injuries</td>
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<td>66</td>
<td></td>
<td>Ruptured or slipped disk</td>
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<td>67</td>
<td></td>
<td>Limiting physical handicaps</td>
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<tr>
<td>68</td>
<td></td>
<td>Muscle cramps</td>
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</tr>
<tr>
<td>69</td>
<td></td>
<td>Varicose veins</td>
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<tr>
<td>70</td>
<td></td>
<td>Amputations</td>
<td></td>
</tr>
<tr>
<td>71</td>
<td></td>
<td>Head injury causing unconsciousness</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td></td>
<td>Paralysis</td>
<td></td>
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<tr>
<td>73</td>
<td></td>
<td>Have you ever had an adverse reaction to medication?</td>
<td></td>
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<tr>
<td>74</td>
<td></td>
<td>Do you smoke?</td>
<td></td>
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<tr>
<td>75</td>
<td></td>
<td>Have you ever had any other medical problems not listed?</td>
<td></td>
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<td></td>
<td></td>
<td>If so, please list or describe below;</td>
<td></td>
</tr>
<tr>
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<td>Is there a family history of high cholesterol?</td>
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<tr>
<td>77</td>
<td></td>
<td>Is there a family history of heart disease or stroke?</td>
<td></td>
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<tr>
<td>78</td>
<td></td>
<td>Is there a family history of diabetes?</td>
<td></td>
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<tr>
<td>79</td>
<td></td>
<td>Is there a family history of asthma?</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
<td>Date of last tetanus shot?</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Vaccination dates?</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 4
RECOMMENDED PHYSICIANS WITH EXPERTISE IN DIVING MEDICINE

List of local Medical Doctors that have training and expertise in diving or undersea medicine. Level I graduates of the Undersea Hyperbaric and Medical Society (UHMS) Fitness to Dive courses (approximately 250 physicians) are listed at http://www.uhms.org (UHMS website, go to Resources, go to Diving Medical Examiners List).

Currently no physicians on the recommended UHMS Diving Medical Examiners List are located near Walla Walla/College Place WA. We suggest that you contact a recommended UHMS physician near you, or request your primary/personal physician to consult with one of the UHMS recommended physicians.

1. Name: __________________________________________
   Address: __________________________________________
   __________________________________________
   Telephone: _________________________________________

2. Name: __________________________________________
   Address: __________________________________________
   __________________________________________
   Telephone: _________________________________________

3. Name: __________________________________________
   Address: __________________________________________
   __________________________________________
   Telephone: _________________________________________

4. Name: __________________________________________
   Address: __________________________________________
   __________________________________________
   Telephone: _________________________________________

5. Name: __________________________________________
   Address: __________________________________________
   __________________________________________
   Telephone: _________________________________________
**APPENDIX 5**

**DEFINITION OF TERMS**

*Air sharing* - Sharing of an air supply between divers.

*ATA(s)* - “Atmospheres Absolute”, Total pressure exerted on an object, by a gas or mixture of gases, at a specific depth or elevation, including normal atmospheric pressure.

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

*Buddy Breathing* - 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* - Pressure at which a pressure containment device would fail structurally.

*Certified Diver* - A diver who holds a recognized valid certification from an organizational member or internationally 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 decompression 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.

*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* - Physical location of a diver during a dive.

*Dive 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.

*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)* - Group of individuals who act as the official representative of the membership organization in matters concerning the scientific diving program (Section 1.24).

*Diving Safety Officer (DSO)* - Individual responsible for the safe conduct of the scientific diving program of the membership organization (Section 1.20).

*EAD* - Equivalent Air Depth (see below).

*Emergency Ascent* - An ascent made under emergency conditions where the diver exceeds the normal ascent rate.
**Enriched Air (EANx)** - A name for a breathing mixture of air and oxygen when the percent of oxygen exceeds 21%. This term is considered synonymous with the term “nitrox” (Section 7.00).

**Equivalent Air Depth (EAD)** - Depth at which air will have the same nitrogen partial pressure as the nitrox mixture being used. This number, expressed in units of feet seawater or saltwater, will always be less than the actual depth for any enriched air mixture.

$f_{N_2}$ - Fraction of nitrogen in a gas mixture, expressed as either a decimal or percentage, by volume.

$f_{O_2}$ - Fraction of oxygen in a gas mixture, expressed as either a decimal or percentage, by volume.

**FFW** - Feet or freshwater, or equivalent static head.

**FSW** - Feet of seawater, or equivalent static head.

**Hookah** - While similar to Surface Supplied in that the breathing gas is supplied from the surface by means of a pressurized hose, the supply hose does not require a strength member, pneumofathometer hose, or communication line. Hookah equipment may be as simple as a long hose attached to a standard scuba cylinder supplying a standard scuba second stage. The diver is responsible for the monitoring his/her own depth, time, and diving profile.

**Hyperbaric Chamber** - See decompression chamber.

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

**Lead Diver** - Certified scientific diver with experience and training to conduct the diving operation.

**Maximum Working Pressure** - 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** - MG

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

**MOD** - Maximum Operating Depth, usually determined as the depth at which the pO$_2$ for a given gas mixture reaches a predetermined maximum.

**MSW** - Meters of seawater or equivalent static head.

**Nitrox** - Any gas mixture comprised predominately of nitrogen and oxygen, most frequently containing between 21% and 40% oxygen. Also be referred to as Enriched Air Nitrox, abbreviated EAN.


National Oceanic and Atmospheric Administration, Office of Undersea Research, US Department of Commerce.

**No-Decompression limits** - 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.

**Oxygen Clean** - All combustible contaminants have been removed.

**Oxygen Compatible** - A gas delivery system that has components (o-rings, valve seats, diaphragms, etc.) that are compatible with oxygen at a stated pressure and temperature.

**Oxygen Service** - A gas delivery system that is both oxygen clean and oxygen compatible.

**Oxygen Toxicity Unit** - OTU

**Oxygen Toxicity** - Any adverse reaction of the central nervous system (“acute” or “CNS” oxygen toxicity) or lungs (“chronic”, “whole-body”, or “pulmonary” oxygen toxicity) brought on by exposure to an increased (above atmospheric levels) partial pressure of oxygen.

**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.
\(p\text{N}_2\) - Inspired partial pressure of nitrogen, usually expressed in units of atmospheres absolute.

\(p\text{O}_2\) - Inspired partial pressure of oxygen, usually expressed in units of atmospheres absolute.

\(\text{Psi}\) - Unit of pressure, “pounds per square inch.

\(\text{Psig}\) - Unit of pressure, “pounds per square inch gauge.

\textit{Recompression Chamber} - see decompression chamber.

\textit{Scientific Diving} - Scientific diving is defined (29CFR1910.402) 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.

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

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

\textit{Surface Supplied Diving} - Surface Supplied: Dives where the breathing gas is supplied from the surface by means of a pressurized umbilical hose. The umbilical generally consists of a gas supply hose, strength member, pneumofathometer hose, and communication line. The umbilical supplies a helmet or full-face mask. The diver may rely on the tender at the surface to keep up with the divers’ depth, time and diving profile.

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

\textit{Umbilical} - 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.

\textit{Working Pressure} - Normal pressure at which the system is designed to operate.
APPENDIX 6

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

Diver: ____________________________ Date: ________________

This letter serves to verify that the above listed person has met the training and pre-requisites as indicated below, and has completed all requirements necessary to be certified as a Scientific Diver as established by the Walla Walla University Standards for Scientific Diving and has demonstrated competency in the indicated areas. Walla Walla University is an AAUS OM and meets or exceeds all AAUS training requirements.

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

Date

_____ Original diving authorization
_____ Written scientific diving examination
_____ Last diving medical examination Medical examination expiration date__________
_____ Most recent checkout dive
_____ Scuba regulator/equipment service/test
_____ CPR training (Agency) CPR Exp. _______________
_____ Oxygen administration (Agency) 02 Exp. _______________
_____ First aid for diving (Agency) F.A. Exp. _______________
_____ Date of last dive Depth

Certification Level
Number of dives completed within previous 12 months Depth Certification fsw
Total number of career dives

Any restrictions? (Y/N)_____ if yes, explain:

Please indicate any pertinent specialty certifications or training:

Emergency Information
Name: ____________________________ Relationship: ________________
Telephone: ______________________ (work) ______________________ (home)
Address: ____________________________________________________
__________________________________________________
__________________________________________________

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

Diving Safety Officer:

_____________________________ ______________________________
(Signature) (Date)

James R. Nestler
Office: 509-527-2551
Cell: 509-540-9984
jim.nestler@wallawalla.edu
APPENDIX 7
DIVING EMERGENCY MANAGEMENT PROCEDURES

Introduction
A diving accident victim could be any person who has been breathing compressed gas underwater regardless of
depth or time underwater. It is essential that emergency procedures are pre-planned and that medical treatment is
initiated as soon as possible. It is the responsibility of Walla Walla University to develop procedures for diving
emergencies including evacuation and medical treatment for each dive location.

Rapid access to emergency care and treatment is crucial in a diving emergency. It is mandatory that a means of
effectively contacting emergency services (fire/rescue, Coast Guard, medical, police) be available and easily
accessible on all dives. **The two most effective means of contact are:**

- **DIAL 911**
- **CONTACT THE COAST GUARD ON VHF CHANNEL 16**

General Procedures
Depending on and according to the nature of the diving accident:

1. Make appropriate contact with victim or rescue as required, WITHOUT ENDANGERING OTHER
   INDIVIDUALS INCLUDING THE RESCUER.
2. Establish (A)irway, (B)reathing, (C)irculation as required.
3. Stabilize the victim.
4. Administer 100% oxygen, if appropriate (in cases of Decompression Illness, or Near Drowning).
5. Call local Emergency Medical System (EMS) by dialing 911 or contacting the Coast Guard on VHF
   channel 16 for transport to nearest medical treatment facility. 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.
6. Call appropriate Diving Accident Coordinator for contact with diving physician, decompression chamber,
   and other appropriate medical/emergency entities.
7. Notify DSO or designee according to the Walla Walla University Scientific Diving Emergency Action
   Plan.
8. Complete and submit Incident Report Form (www.aauus.org) to the Walla Walla University DCB and the
   AAUS (Section 2.70 Required Incident Reporting).

List of Emergency Contact Numbers Appropriate For Dive Location

__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
__________________________________________________________
Available Procedures
- Emergency care
- Recompression
- Evacuation

Emergency Plan Content
- Name, telephone number, and relationship of person to be contacted for each diver in the event of an emergency.
- Nearest operational decompression chamber.
- Nearest accessible hospital.
- Available means of transport.

EMERGENCY COMMUNICATION

1. Emergency Services
   In virtually all areas of the U.S. and Canada 911 is the emergency services number to call. The Coast Guard can be contacted with a marine radio on VHF channel 16 for emergency assistance. CB and FRS/GMRS radios typically are not capable of contacting emergency services or the Coast Guard and are therefore not appropriate.
   
   State your exact location, the nature of the emergency, and request medical assistance. Indicate to the responding unit that this injury could be the result of a scuba diving incident. Once communication is established, it should be maintained or available for call-back in case further instructions or directions to the location are needed. If you are calling from a phone, give them your telephone number for call back if you or they need to hang up.

2. WWU Dive Safety Officer and Campus Security
   Once the victim is under the control of professional emergency personnel, contact the WWU Dive Safety Officer (Jim Nestler, 509-540-9984) and WWU Campus Security (College Place, 509-527-2222) and inform them of the situation. They will contact the appropriate WWU individuals and departments.

3. Diving Alert Network (DAN)
   DAN operates as a 24 hour, 7 days a week emergency consultation service for diving accidents and as a clearinghouse for information on diving accidents and diving accident treatment. This service provides help to the diver and/or physician on the diagnosis, immediate care, transportation, and hyperbaric treatment facility location. DAN is located at the Duke University Medical Center and is sponsored by public memberships, NOAA, NIOSH, DOE, and Undersea Medical Society. The phone number for DAN is (919) 684-9111.
4. EMERGENCY TELEPHONE NUMBERS

<table>
<thead>
<tr>
<th>Fire/Medical/Police</th>
<th>911</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Nestler, Dive Safety Officer</td>
<td>(509) 540-9984 (cell)</td>
</tr>
<tr>
<td>Dave Habenicht, Rosario Facilities Manager</td>
<td>(360) 661-5105 (cell)</td>
</tr>
<tr>
<td>WWU Campus Security (College Place)</td>
<td>(509) 527-2222</td>
</tr>
<tr>
<td>Island Hospital, Anacortes (Emergency Room)</td>
<td>(360) 299-1311</td>
</tr>
<tr>
<td>Whidbey General Hospital, Coupeville</td>
<td>(360) 678-5151</td>
</tr>
<tr>
<td>Virginia Mason Hospital (Emergency Room)</td>
<td>(206) 583-6433</td>
</tr>
<tr>
<td>Virginia Mason Hospital (Hyperbaric Unit)</td>
<td>(206) 583-6543</td>
</tr>
<tr>
<td>Coast Guard Rescue Coordination Center, Seattle</td>
<td>(206) 220-7001</td>
</tr>
<tr>
<td>Joint Rescue Coordination Center, Victoria</td>
<td>(800) 567-5111</td>
</tr>
<tr>
<td>Divers Alert Network (DAN)</td>
<td>(919) 684-9111</td>
</tr>
</tbody>
</table>

RESCUE PROCEDURES

1. General

   While the main concern is for an injured diver, the rescuer should not take unnecessary risks which could result in placing themselves in danger.

   a. The majority of diving accidents occur on ascent and at or near the surface, so dive team members should be prepared to perform in-water rescues.

   b. The injured diver must be made positively buoyant and relieved of all items carried or attached. **DITCHING OF WEIGHTS IS EXTREMELY IMPORTANT.**

   c. All equipment of the injured and the rescuer should be removed as soon as possible, as this improves the effectiveness of resuscitation techniques.

   d. It is critical to avoid rough handling of spine/bone injuries or persons in shock when exiting the water.

   e. If possible, emergency aid should be sought concurrently with the rescue, but if alone, the rescuer should not leave the injured diver.

2. Conscious Diver

   A conscious diver must receive continual positive verbal support, help in attaining positive buoyancy, and assistance to safety.

   a. Talk to them in positive conversational tones all the time while approaching and establishing positive buoyancy. **DITCH THEIR WEIGHTS.** Remove items carried or attached to belts and move them to safety. Firm physical hand contact and support, frequent eye contact, and frequent conversation can be very reassuring and help prevent panic.
b. Struggling/panicky diver - Due to panic or injury this diver may be extremely dangerous to the rescuer.

(1). Use any method possible to lend assistance without coming into direct contact. Verbally talk them back into control. Push an inflated BCD or alternate flotation device to them. Sometimes a panicked diver will swim/thrash toward the rescuer, who can keep backing away until they reach a float, boat, or beach exit.

(2). If direct contact is used the rescuer should have their BCD deflated and regulator in their mouth. The victim should be approached from behind. If swarmed onto by the victim, swim down to escape.

c. Exiting the Water - Attempt to have the diver in a calm state before exiting the water. Provide assistance and verbal direction for removing equipment and /or exiting. Keep a very close watch for the signs of shock.

3. Unconscious Diver

When approaching a supposedly unconscious diver, shake them first to make sure that they are indeed in trouble.

a. If the unconscious diver is on the surface, first roll them face up, then DITCH THEIR WEIGHTS. Shout for help. Start removing the victim’s and your own scuba equipment to make the rescue easier.

b. If the unconscious diver is underwater, follow “Recommendations for rescue of a submerged unresponsive compressed-gas diver, Mitchell et al. 2012” (see attached flowchart).

c. When the victim is out of the water and in a place where CPR can be done, move the victim’s hood aside and check the carotid artery for a pulse. If there is none, start CPR. CPR can be done through the suit. Continue CPR until medical help arrives and takes command of the situation.

4. Continue to monitor vital signs and administer first aid and CPR, as required. Administer 100% oxygen as soon as possible if the victim is breathing. Administration of oxygen to the decompression/embolism injured victim will increase their chances of survival. In most accidents, the injured should be treated for shock and kept warm. If alone, do not leave the victim but as soon as possible request emergency assistance at the scene, or transport for medical treatment. The first four to six hours following a decompression accident are most critical.

5. The attending dive team member or person-in-charge should accompany the injured diver to the treatment center to describe the circumstances of the accident to medical personnel. At the very least, personal identification, dive profile, symptoms, time of rescue, time of treatment started, progression of symptoms, should be written down and sent with the injured diver.
Recommendations for rescue of a submerged unresponsive compressed-gas diver


Diver found unresponsive at depth

Maintain regulator in mouth

YES

Regulator in mouth?

Current convulsing?

NO

Ascent unduly hazardous for rescuer?

YES

Make victim positively buoyant and send to surface

NO

Wait for convulsion to finish

Head in neutral position

Ascend according to training agency recommendations.

At surface turn face up and establish positive buoyancy.

Remove victim from water and initiate CPR if indicated

YES

Is immediate assisted removal from water possible?

NO

Give 2 rescue breaths and assess surface support availability

YES

Surface support < 5 minutes away?

NO

Tow victim or wait whilst administering intermittent rescue breaths

Remain in place giving rescue breaths for approximately 1 minute, then tow (without breaths) to nearest surface support

Summary of important recommendations and decision-making in rescue of an unresponsive diver from depth. This chart should be considered along with the relevant comments made in the relevant sections of this paper.
MISSING DIVER PROCEDURES

In the event of a missing diver or presumed fatality, notify the appropriate emergency agency immediately, by calling 911 or contacting the Coast Guard on VHF channel 16. Do not undertake a search where weather, current, or depth conditions may compromise the safety of the search group. Walla Walla University personnel should not participate in the search and recovery operations, unless specifically authorized.

PRIMARY SITES OF MEDICAL TREATMENT FOR DIVING ACCIDENTS

Washington

Virginia Mason Hospital, Seattle (206) 583-6543

Fairchild AFB, Spokane (509) 247-5406

U.S. Naval Torpedo Station, Keyport (206) 396-2552

British Columbia

Vancouver General Hospital, Vancouver (604) 875-4111

Fleet Diving Unit Pacific, Victoria (604) 388-1781

Oregon

Providence Hospital, Portland (503) 230-6061
APPENDIX 8
DIVE COMPUTER GUIDELINES

1. Only those makes and models of dive computers specifically approved by the Diving Control Board may be used (Appendix 21).

2. Any diver using a dive computer must have a current copy of the manual appropriate for the computer being used.

3. Any diver desiring the approval to use a dive computer as a means of determining decompression status must demonstrate proficiency on the correct use of the specific unit being used to the DSO or DCB scientific diver member.

4. Each diver relying on a dive computer to plan dives and indicate or determine decompression status must have his/her own unit.

5. On any given dive, both divers in the buddy pair must follow the most conservative dive computer.

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

7. A diver should not dive for 18 hours before activating a dive computer to use it to control their diving.

8. Once the dive computer is in use, it must not be switched off until it indicates complete out gassing has occurred or 18 hours have elapsed, whichever comes-first.

9. When using a dive computer, non-emergency ascents are to be at a rate specified for the make and model of dive computer being used.

10. Whenever practical, divers using a dive computer should make a stop between 10 and 30 feet for 5 minutes, especially for dives below 60 fsw.

11. Multiple deep dives require special consideration.
COLLECTION CRITERIA:
The "Dive Time in Minutes", The Number of Dives Logged", and the "Number of Divers Logging Dives" will be collected for the following categories.

- Dive Classification
- Breathing Gas
- Diving Mode
- Decompression Planning and Calculation Method
- Depth Ranges
- Specialized Environments
- Incident Types

Dive Time in Minutes is defined as the surface to surface time including any safety or required decompression stops.

A Dive is defined as a descent into water, an underwater diving activity utilizing compressed gas, an ascent/return to the surface, and a surface interval of greater than 10 minutes.

Dives will not be differentiated as openwater or confined water dives. But openwater and confined water dives will be logged and submitted for AAUS statistics classified as either scientific or training/proficiency.

A "Diver Logging a Dive" is defined as a person who is diving under the auspices of your scientific diving organization. Dives logged by divers from another AAUS Organization will be reported with the divers home organization. Only a diver who has actually logged a dive during the reporting period is counted under this category.

Incident(s) occurring during the collection cycle. Only incidents occurring during, or resulting from, a dive where the diver is breathing a compressed gas will be submitted to AAUS.

DEFINITIONS:

Dive Classification:

- Scientific Dives: Dives that meet the scientific diving exemption as defined in 29 CFR 1910.402. Diving tasks traditionally associated with a specific scientific discipline are considered a scientific dive. Construction and trouble-shooting tasks traditionally associated with commercial diving are not considered a scientific dive.
- Training and Proficiency Dives: Dives performed as part of a scientific diver training program, or dives performed in maintenance of a scientific diving certification/authorization.

Breathing Gas:

- Air: Dives where the bottom gas used for the dive is air.
- Nitrox: Dives where the bottom gas used for the dive is a combination of nitrogen and oxygen other than air.
- Mixed Gas: Dives where the bottom gas used for the dive is a combination of oxygen, nitrogen, and helium (or other "exotic" gas), or any other breathing gas combination not classified as air or nitrox.
**Diving Mode:**

- **Open Circuit Scuba:** Dives where the breathing gas is inhaled from a self contained underwater breathing apparatus and all of the exhaled gas leaves the breathing loop.
- **Surface Supplied:** Dives where the breathing gas is supplied from the surface by means of a pressurized umbilical hose. The umbilical generally consists of a gas supply hose, strength member, pneumofathometer hose, and communication line. The umbilical supplies a helmet or full-face mask. The diver may rely on the tender at the surface to keep up with the divers’ depth, time and diving profile.
- **Hookah:** While similar to Surface Supplied in that the breathing gas is supplied from the surface by means of a pressurized hose, the supply hose does not require a strength member, pneumofathometer hose, or communication line. Hookah equipment may be as simple as a long hose attached to a standard scuba cylinder supplying a standard scuba second stage. The diver is responsible for the monitoring his/her own depth, time, and diving profile.
- **Rebreathers:** Dives where the breathing gas is repeatedly recycled in the breathing loop. The breathing loop may be fully closed or semi-closed. Note: A rebreather dive ending in an open circuit bailout is still logged as a rebreather dive.

**Decompression Planning and Calculation Method:**

- Dive Tables
- Dive Computer
- PC Based Decompression Software

**Depth Ranges:**

Depth ranges for sorting logged dives are 0-30, 31-60, 61-100, 101-130, 131-150, 151-190, and 191->. Depths are in feet seawater. A dive is logged to the maximum depth reached during the dive. Note: Only "The Number of Dives Logged" and "The Number of Divers Logging Dives" will be collected for this category.

**Specialized Environments:**

- **Required Decompression:** Any dive where the diver exceeds the no-decompression limit of the decompression planning method being employed.
- **Overhead Environments:** Any dive where the diver does not have direct access to the surface due to a physical obstruction.
- **Blue Water Diving:** Openwater diving where the bottom is generally greater than 200 feet deep and requiring the use of multiple-tethered diving techniques.
- **Ice and Polar Diving:** Any dive conducted under ice or in polar conditions. Note: An Ice Dive would also be classified as an Overhead Environment dive.
- **Saturation Diving:** Excursion dives conducted as part of a saturation mission are to be logged by "classification", "mode", "gas", etc. The "surface" for these excursions is defined as leaving and surfacing within the Habitat. Time spent within the Habitat or chamber shall not be logged by AAUS.
- **Aquarium:** An aquarium is a shallow, confined body of water, which is operated by or under the control of an institution and is used for the purposes of specimen exhibit, education, husbandry, or research. (Not a swimming pool)
Incident Types:

- Hyperbaric: Decompression Sickness, AGE, or other barotrauma requiring recompression therapy.
- Barotrauma: Barotrauma requiring medical attention from a physician or medical facility, but not requiring recompression therapy.
- Injury: Any non-barotrauma injury occurring during a dive that requires medical attention from a physician or medical facility.
- Illness: Any illness requiring medical attention that can be attributed to diving.
- Near Drowning/ Hypoxia: An incident where a person asphyxiates to the minimum point of unconsciousness during a dive involving a compressed gas. But the person recovers.
- Hyperoxic/Oxygen Toxicity: An incident that can be attributed to the diver being exposed to too high a partial pressure of oxygen.
- Hypercapnea: An incident that can be attributed to the diver being exposed to an excess of carbon dioxide.
- Fatality: Any death accruing during a dive or resulting from the diving exposure.
- Other: An incident that does not fit one of the listed incident types.

Incident Classification Rating Scale:

- Minor: Injuries that the OM considers being minor in nature. Examples of this classification of incident would include, but not be limited to:
  - Mask squeeze that produced discoloration of the eyes.
  - Lacerations requiring medical attention but not involving moderate or severe bleeding.
  - Other injuries that would not be expected to produce long term adverse effects on the diver’s health or diving status.
- Moderate: Injuries that the OM considers being moderate in nature. Examples of this classification would include, but not be limited to:
  - DCS symptoms that resolved with the administration of oxygen, hyperbaric treatment given as a precaution.
  - DCS symptoms resolved with the first hyperbaric treatment.
  - Broken bones.
  - Torn ligaments or cartilage.
  - Concussion.
  - Ear barotrauma requiring surgical repair.
- Serious: Injuries that the OM considers being serious in nature. Examples of this classification would include, but not be limited to:
  - Arterial Gas Embolism.
  - DCS symptoms requiring multiple hyperbaric treatment.
  - Near drowning.
  - Oxygen Toxicity.
  - Hypercapnea.
  - Spinal injuries.
  - Heart attack.
  - Fatality.
APPENDIX 10

APPLICATION FOR SCIENTIFIC DIVER OR SCIENTIFIC DIVER IN TRAINING CERTIFICATION
APPLICATION FOR SCIENTIFIC DIVER or SCIENTIFIC DIVER IN TRAINING CERTIFICATION

PERSONAL INFORMATION

<table>
<thead>
<tr>
<th>Diver's Name</th>
<th>Today's Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permanent Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Birthdate</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SCUBA CERTIFICATION INFORMATION

<table>
<thead>
<tr>
<th>Certification Level</th>
<th>Agency</th>
<th>Date Certified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Open Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rescue Diver</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divemaster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DAN Divers First Aid for Professional Divers</td>
<td>Divers Alert Network</td>
<td>*</td>
</tr>
</tbody>
</table>

Other: 

Please attach copies of certification cards
*Date of most recent certification

SCUBA EXPERIENCE INFORMATION

<table>
<thead>
<tr>
<th>Total number of lifetime dives</th>
<th>Total number of cold water dives</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum depth experienced</th>
<th>Number of dives within the last 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date of most recent dive</th>
<th>Location of most recent dive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# EMERGENCY CONTACT INFORMATION

<table>
<thead>
<tr>
<th>Person to contact in case of emergency</th>
<th>Relationship to you</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Permanent Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comments or additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
# Scientific Diver Certification

<table>
<thead>
<tr>
<th>Diver’s Name</th>
<th>Today’s Date</th>
</tr>
</thead>
</table>

## On File
- Application
- Waiver (yearly)
- Medical Clearance (good through ________)
- Scientific Diver Agreement
- DAN DFA Pro (good through ________)
- Equipment Maintenance (yearly)

## Authorizations
- **Depth**
  - 30 ft
  - 60 ft
  - 100 ft
  - 130 ft
- **Night**
  - Yes
  - No
- **Nitrox**
  - Yes
  - No
- **Dive Computer**
  - Yes
  - No

I have completed all requirements in Section 5.0 of the “Walla Walla University Standards for Scientific Diving” which are necessary to authorize me to engage in scientific diving. I have convinced the Dive Safety Officer and members of the Diving Control Board that I have the training, skills, and proficiencies to dive as a scientific diver without supervision. I understand that my authorization to dive can be suspended by the Dive Safety Officer if my dive-related activities and judgement are considered by the Dive Safety Officer to affect the safety of me, other divers, and others who may be associated with diving.

<table>
<thead>
<tr>
<th>Signature of Scientific Diver Applicant</th>
<th>Date</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Signature of Dive Safety Officer</th>
<th>Date</th>
</tr>
</thead>
</table>

Comments:

---

Revised 1/2017
I have completed all requirements in Section 5.40 of the “Walla Walla University Standards for Scientific Diving” which are necessary to authorize me to engage in scientific diving as a Scientific Diver-In-Training. I have convinced the Dive Safety Officer and members of the Dive Control Board that I have the training, skills, and proficiencies to continue training as a scientific diver under the supervision of a certified Scientific Diver, as approved by the Dive Safety Officer. I understand that my authorization to dive can be suspended by the Dive Safety Officer if my dive-related activities and judgement are considered by the Dive Safety Officer to affect the safety of me, other divers, and others who may be associated with diving.

<table>
<thead>
<tr>
<th>Signature of Scientific Diver Applicant</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signature of Dive Safety Officer</td>
<td>Date</td>
</tr>
</tbody>
</table>

Comments:
APPENDIX 13

SCIENTIFIC DIVING AGREEMENT
SCIENTIFIC DIVING AGREEMENT

Your signature on this statement is required as proof that you have read and agree to adhere to the regulations and procedures for scientific diving established detailed in the Walla Walla University Standards for Scientific Diving. Please read this document carefully and direct any questions you may have to the Dive Safety Officer (DSO) before signing.

I understand that as a scientific diver I must (please check each box on BOTH SIDES OF THIS PAGE):

☐ Read, understand, and adhere to the regulations and procedures in the Walla Walla University Standards for Scientific Diving.

☐ Dive within my certification limits unless on a training dive with an authorized scientific diver.

☐ Refuse to dive, or terminate a dive, if any conditions are or become unfavorable.

☐ Report any unsafe practices to the DSO.

☐ Report all injuries and incidents to the DSO and proper authorities immediately, and seeking appropriate treatment.

☐ Abide by basic safe diving practices, including but not limited to: listening intently to dive briefings and debriefings, following dive plans, maintaining proper buoyancy, never holding my breath, being proficient in dive table and/or computer use.

☐ Maintain personal dive gear correctly, including annual service requirements.

☐ Adhere to the buddy system on all scuba dives.

☐ Carry the appropriate equipment for every dive, including an alternate air source (octopus).

☐ Conduct functional checks of diving equipment (both mine and my buddy’s) prior to entry.

☐ Never ascend faster than 30 feet per minute on any dive.

(Please turn to other side)
☐ Carry out a safety stop (3-5 minute stop at 15-20 feet) if appropriate.

☐ Terminate all dives with enough air in my tank to surface with at least 500 PSI.

☐ Ensure that I understand the proper emergency procedures for each dive that I undertake, and stay current in the use of First Aid, Emergency Oxygen, CPR, and AED.

☐ Never use Walla Walla University equipment for any purpose other than its intended and approved use.

☐ Not engage in dive activities in an environment with special conditions (such as an overhead environment or blue water diving) without express consent of the DSO.

☐ Understand that I can deviate from the requirements of the Walla Walla University Standards for Scientific Diving ONLY to the extent necessary to prevent or minimize a situation that is likely to result in death, serious physical harm, or major environmental damage.

Scuba diving has inherent risks. The ultimate responsibility for my safety rests with me. It is my responsibility and duty to refuse to dive if, in my judgment, conditions are unsafe or unfavorable, or if I would be violating the precepts of my training or the regulations of the Walla Walla University Standards for Scientific Diving.

I have read the above statements and have had any questions answered to my satisfaction.

Diver’s Name (please print) ___________________________________

Diver’s Signature _____________________________________________

Today’s Date _______________________________________________
EQUIPMENT INVENTORY AND MAINTENANCE SUMMARY

Diver ________________________________ Today’s Date ______________

“Service/Inspection Date” below refers to the most recent servicing or inspection.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Make/Model</th>
<th>Serial # (if applicable)</th>
<th>Service/Inspection Date</th>
<th>Service/Inspection Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulator – 1st Stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulator – 2nd Stage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulator - Octopus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Pressure Gauge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth Gauge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dive Computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BCD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scuba Tank</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wet Suit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Suit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry Suit Valves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mask</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snorkel</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Belt System</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated Weight System</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underwater Timing Device</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface Signaling Device</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approved by DSO: ________________________________ Date: ______________

Comments:
# SCUBA EMERGENCY ACTION PLAN

**STOP**

**BREATHE**

**THINK**

**ACT**

## DIVE LOCATION

<table>
<thead>
<tr>
<th>Dive Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Your Land Exit Point in a Scuba Emergency:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location Information for Emergency Services:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

## EMERGENCY SERVICES

<table>
<thead>
<tr>
<th>Location of Nearest Phone: (and access, if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency Phone Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>911 (for local emergency services)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VHF Radio Emergency Channel:</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

## FIRST AID & MEDICAL ASSISTANCE

<table>
<thead>
<tr>
<th>Location of O₂ Kit:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of First Aid Kit:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

## Nearest Hospital

<table>
<thead>
<tr>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

## Nearest Chamber

<table>
<thead>
<tr>
<th>Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone Number:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Location:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
General Procedures
1. Make appropriate contact with victim or rescue as required, WITHOUT ENDANGERING OTHERS INCLUDING THE RESCUERS.
2. Establish (A)irway, (B)reathing, (C)irculation as required.
3. Stabilize the victim.
4. Administer 100% oxygen, if appropriate (in cases of Decompression Illness or Near Drowning).
5. Activate local EMS by dialing 911 or contacting the Coast Guard on VHF channel 16.
6. Notify DSO.
7. Collect diving equipment involved in the diving incident, if safely possible.
8. Complete and submit Incident Report Form.

Missing Diver Procedures
1. Assess the degree of urgency. Consider time overdue, planned dive profile, where and when diver was last seen.
2. Recall all divers.
3. Determine last known location. Mark with buoy, assign spotters, take compass headings to landmarks.
4. Scan the surface/shoreline for divers and bubbles.
5. Activate local EMS by dialing 911 or contacting the Coast Guard on VHF channel 16.
6. Any underwater search should only be performed by rescue-trained buddy divers, WITHOUT ENDANGERING OTHERS INCLUDING THE RESCUERS.
7. Notify DSO.
8. Complete and submit Incident Report Form.

Emergency Telephone Numbers

Local Emergency Services
Jim Nestler, Dive Safety Officer (509) 540-9984 (cell)
Dave Habenicht, Rosario Facilities Manager (360) 661-5105 (cell)
WWU Campus Security (College Place) (509) 527-2222
Island Hospital, Anacortes (Emergency Room) (360) 299-1311
Whidbey General Hospital, Coupeville (360) 678-5151
Virginia Mason Hospital (Emergency Room) (206) 583-6433
Virginia Mason Hospital (Hyperbaric Unit) (206) 583-6543
Coast Guard Rescue Coordination Center, Seattle (206) 220-7001
Joint Rescue Coordination Center, Victoria (800) 567-5111
Divers Alert Network (DAN) (919) 684-9111

Local Emergency Services 911

STOP           BREATHE           THINK           ACT
### SCIENTIFIC DIVE FORM

**INSTRUCTIONS:** Each diver must fill out this form before each dive, and complete the form upon completion of each dive. Each diver must be a currently-approved WWU Scientific Diver or Scientific Diver In Training. All dives using WWU equipment, facilities, or property must be for research or academic activities. No recreational diving is allowed.

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your Name</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Buddy’s Name</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Lead Diver</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Dive Date</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Dive Location</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Dive Objective</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Departure Time</td>
<td>8am</td>
</tr>
<tr>
<td>Actual Return</td>
<td>12pm</td>
</tr>
<tr>
<td>Planned Depth and Bottom Time</td>
<td>100 ft</td>
</tr>
<tr>
<td>Shore Dive</td>
<td>☑</td>
</tr>
<tr>
<td>Boat Operator</td>
<td>_____________________________</td>
</tr>
<tr>
<td>Tank Size</td>
<td>☑ 72</td>
</tr>
<tr>
<td>Begin air</td>
<td>_____ psi</td>
</tr>
<tr>
<td>Self Gear Check</td>
<td>☑</td>
</tr>
<tr>
<td>First Aid Kit</td>
<td>☑</td>
</tr>
<tr>
<td>(prior to entry)</td>
<td></td>
</tr>
<tr>
<td>Cell Phone</td>
<td>☑</td>
</tr>
<tr>
<td>Dive Flag</td>
<td>☑</td>
</tr>
<tr>
<td>DAN Emergency Procedure Cards</td>
<td>☑</td>
</tr>
<tr>
<td>Night Dive</td>
<td>☑</td>
</tr>
<tr>
<td>Secondary Light</td>
<td>☑</td>
</tr>
</tbody>
</table>

**AUTHORIZATION (if not part of a current and approved Dive Plan)**

Dive Safety Officer’s Signature _____________________________

Revised 1/2017
NITROX AUTHORIZATION FORM

Verification of training and certification is required for the use of any non-standard breathing mix for which the fO₂ is different than 21%.

<table>
<thead>
<tr>
<th>Name</th>
<th>Today's Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrox Certification Agency</td>
<td>Nitrox Certification Date</td>
</tr>
<tr>
<td>Estimated Number of Nitrox Dives</td>
<td>Date of Most Recent Nitrox Dive</td>
</tr>
</tbody>
</table>

Please attach a copy of your Nitrox certification card or verification of training.

- Do you own Nitrox tables? □ No □ Yes
- Do you own a Nitrox computer? □ No □ Yes
- Do you own Nitrox tanks? □ No □ Yes
- Do you own a Nitrox analyzer? □ No □ Yes

Dive Safety Officer Approval

X ___________________________ Date ____________

DSO Comments:
APPENDIX 18

SCIENTIFIC DIVING ACCIDENT/INCIDENT REPORT FORM
SCIENTIFIC DIVING ACCIDENT/INCIDENT REPORT FORM

Notify Diving Safety Officer immediately after the incident occurs
Complete this form within 24 hours and submit it to the Diving Safety Officer

<table>
<thead>
<tr>
<th>Name: Last</th>
<th>First</th>
<th>MI.</th>
<th>Date of Birth</th>
<th>Social Security No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>/ /</td>
<td>- -</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Local Address: Street</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
<th>Phone No.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Permanent Address: Street</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
<th>Phone No.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Current Status: Faculty/Staff</th>
<th>Student</th>
<th>Visiting Scientist</th>
<th>Home Academic Institution</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Your role in this incident: Scuba Diver</th>
<th>Dive Buddy</th>
<th>Boat Operator</th>
<th>Witness</th>
<th>Other</th>
</tr>
</thead>
</table>

Was this incident work-related? Did this incident occur while you were performing duties as an employee of Walla Walla University?

- Yes
- No

If YES, you must complete the WWU Work-Related Incident Report Form in addition to this Scuba Diving Incident Report Form within 24 hours.

If NO, you must complete the WWU Non-Work-Related Incident Report Form in addition to this Scuba Diving Incident Report Form within 24 hours.

Location of Scuba Diving Incident:

How could this incident have been prevented? Use extra pages if necessary.

FULLY DESCRIBE INCIDENT: If you fell, was it indoors or outdoors? If you were struck, name the object. Were you lifting, pulling, pushing or carrying? If machinery or equipment was involved, name and describe its function. Include names and roles of scuba divers, boat operators, and other people involved in or witness to the incident. Include dive profile and equipment used. Use extra pages if necessary.

Nature of injury and part of body affected: (Example: Cut to my right index finger / Cough due to inhalation of water)

Did you seek medical treatment?

- Yes
- No

<table>
<thead>
<tr>
<th>Name of Hospital and/or Clinic:</th>
<th>Name of Physician:</th>
</tr>
</thead>
</table>
Check and circle all factors contributing to the incident.

☐ HUMAN
  Training
  Task performance
  Scuba history
  Panic

☐ SITE CONDITIONS
  Entanglement hazards
  Current
  Visibility
  Weather

☐ EQUIPMENT
  Scuba equipment
  Boating equipment
  Research equipment

☐ TIME FACTORS
  Length of dive
  Air availability
  Sequence of events

☐ POLICIES AND PROCEDURES
  Safety Policies and Procedures
  Operating specifications

Describe how these factors contributed to the incident (if not described previously)

Signature of Person Completing This Form:           Date:           Diving Safety Officer Signature:           Date:

Diving Safety Officer will submit this form to the Diving Control Board chair and to Risk & Safety Management within 24 hours of receiving it. Diving Safety Officer will ensure that additional forms are completed and procedures are followed by the appropriate individuals as required by WWU policies.

Diving Control Board Actions
DIVE PLAN APPLICATION

This Dive Plan has been developed for scientific divers to use in meeting the requirements of the Walla Walla University Standards for Scientific Diving. This Dive Plan is applicable only to the diving operations and scientific divers listed below. It is the responsibility of each participating scientific diver to be familiar and ensure compliance with the Walla Walla University Standards for Scientific Diving.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project Leader</th>
<th>Today's Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Location of Dives</th>
<th>Dates of Dive Plan</th>
<th>Lead Diver(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Participating Divers</th>
<th>Estimated Number of Dive Days</th>
<th>Maximum Number of Dives Per Day</th>
<th>Maximum Dive Depth and Underwater Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description of Dives (scientific objectives, basic dive profile, peripheral equipment)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous Conditions Anticipated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Location-Specific Scuba Emergency Action Plan:** to be included with this Dive Plan Application

**Dive Safety Officer Approval**

X ___________________________ Date ______________

DSO Comments:
WALLA WALLA UNIVERSITY
LIABILITY WAIVER, ASSUMPTION OF RISK, AND RELEASE AGREEMENT
ROSARIO SCUBA AND SNORKELING

BE SURE TO PRINT YOUR NAME BELOW, AND READ AND INITIAL EACH SECTION.

I, ____________________, wish to participate in the ____________________ (Activity) offered by Walla Walla University (University). The term University as used in this agreement shall include Walla Walla University along with its officers, directors, agents, employees, successors, and assigns. As a precondition to participating in the Activity, I have read the following Liability Waiver, Assumption of Risk, and Release Agreement (Agreement) and agree to its terms.

1. Express Assumption of Risk. I understand that participating in the Activity entails inherent risks of physical injury, including, but not limited to, the risks described in the Activity Detail Form on the reverse side of the Agreement. I have been given the chance to ask questions concerning the Activity Detail Form, and all such questions have been answered to my satisfaction. Having read this form, I am fully aware of the risks and hazards associated with the Activity. Also, I understand and agree that situations may arise during the Activity which may be beyond the control of the leaders or participants. The risks include, by way of example and not limitation, accidents that may happen while traveling to the Activity locations. I VOLUNTARILY ASSUME ALL RISKS OF loss, property damage, or personal injury including death, associated with participation in the Activity, unless caused by the gross negligence or willful misconduct of the University, its officers, trustees, agents, employees, or volunteers.

I have read and understand the above. (Initial here.) __________

2. Liability Release. In consideration for the University allowing me to participate in the Activity, I RELEASE, FOREVER DISCHARGE, AND AGREE NOT TO SUE THE UNIVERSITY FROM ANY LIABILITIES, CLAIMS, DEMANDS, ACTIONS, CAUSES OF ACTIONS, COSTS, AND EXPENSES OF ANY NATURE WHATSOEVER ARISING OUT OF ANY LOSS, DAMAGE, OR INJURY, INCLUDING DEATH THAT MAY BE SUSTAINED BY ME OR PROPERTY BELONGING TO ME, and arising from the Activity or while upon the premises where the Activity is being conducted, except those claims arising from the gross negligence or willful misconduct of the University. I hereby waive all claims which I have now or may hereafter have against the University in any connection with my participation in the Activity.

I have read and understand the above. (Initial here.) __________

3. Indemnification. I agree to indemnify and hold harmless the University from and against any loss, liability, damage, or costs, including court costs and attorneys' fees, that the University may incur arising from my involvement in the Activity.

I have read and understand the above. (Initial here.) __________

4. Warranty of Physical Fitness. I agree that it is my sole responsibility to be familiar with the physical and/or mental demands associated with the above-named activity. With these demands in mind, I have no physical or medical condition which, to my knowledge, would endanger myself or others if I participate in this Activity, or would interfere with my ability to participate in this Activity. I maintain medical insurance that covers me for accidents and illnesses while I am participating in this Activity. I understand the University has not made, nor will make, any investigation into my physical fitness or ability to participate in the Activity, and the University is relying on my warranty of my physical condition.

I have read and understand the above. (Initial here.) __________

5. Emergency Medical Treatment. I grant the University permission to authorize emergency medical treatment, and agree that such action by the University shall be subject to the terms of this Agreement. I understand and agree that the University assumes no responsibility for any injury or damage that might arise out of or in connection with such authorized emergency medical treatment.

I have read and understand the above. (Initial here.) __________

It is further my express intent that this Agreement shall bind the members of my family and spouse (if any), my estate, heirs, administrators, assigns, and personal representatives. I agree that this Agreement and any claims from my participation in the Activity shall be construed in accordance with the laws of the State of Washington, without regard to its conflict of laws provision. The courts in Walla Walla County shall be the forum for any lawsuit arising from the Activity or incident to this Agreement. The terms of this Agreement shall be severable, such that if a court of competent jurisdiction holds any terms to be illegal or unenforceable, the validity of the remaining portions of this Agreement shall not be affected thereby.

I have carefully read both sides of this Agreement form and fully understand its contents. I agree to be bound by its terms. I am aware that this is a release of liability, a waiver of claims, an agreement not to sue, and a contract between myself and the University, and for the benefit of others described herein, I sign it of my own free will.

THIS IS A RELEASE OF LEGAL RIGHTS. READ AND UNDERSTAND BOTH SIDES BEFORE SIGNING.

PLEASE INITIAL WHERE INDICATED ON THIS PAGE, AND SIGN ON THE REVERSE SIDE OF THIS DOCUMENT.
ACTIVITY DETAIL FORM

Name of Activity/Class: Rosario Scuba and Snorkeling

Date(s) of Activity/Class: ___________________________

Location of Activity/Class: WWU Campus

Other: Rosario Beach Marine Laboratory area, Anacortes, WA

Description of Activity/Class:
Scuba/Skin Diving and Snorkeling

ALL OCCUPANTS OF MOTOR BOATS AND THOSE WHITE WATER BOATING (INCLUDING CANOES, KAYAKS, ROWBOATS, ETC.) SHALL WEAR A COAST GUARD-APPROVED PERSONAL FLOTATION DEVICE AT ALL TIMES.

By participating in the above activity/class you may be exposed to several inherent risks, including but not limited to those listed below:

- Asphyxiation
- Breathing difficulties
- Broken bones
- Cardiac arrest
- Choking
- Death
- Dehydration
- Eye injuries
- Fainting, dizziness, or lightheadedness
- Head, neck, or back injuries
- Increased heart rate
- Injuries from other participants, objects, equipment, or vehicles
- Internal injuries
- Joint dislocations, sprains, stiffness, or soreness
- Muscle strains, stiffness, soreness, or cramps
- Pain or discomfort
- Puncture wounds
- Skin cuts, abrasions, or contusions
- Drowning
- Heat exhaustion
- Hypothermia
- Injuries from animal, insect, or plant exposure
- Injuries from weather exposure
- Sunburn

We request that you conduct your participation with the safety of yourself and others in mind.

THIS IS A RELEASE OF LEGAL RIGHTS. READ AND UNDERSTAND BOTH SIDES BEFORE SIGNING.

Name of Participant (printed) ______________________________________________________________________

Signature ______________________________________________________________________________________

Date ______________ Age __________________ Signature of Guardian if 17 years old or younger

Revised 1/2017
APPROVED SCUBA EQUIPMENT MANUFACTURERS

Regulators and dive computers must be approved by the Diving Control Board (Section 3.20 Equipment). The DCB approves the makes and models of regulators and dive computers produced by the scuba equipment manufacturers listed below. Makes and models produced by other scuba equipment manufacturers will require review and approval by the DCB on a case-by-case basis.

- Aeris
- Apeks
- Aqualung
- Atomic
- Cressi
- Genesis
- Hollis
- Liquivision
- Mares
- Oceanic
- Poseidon
- Scubapro
- Sherwood
- Suunto
- Tusa
- XS Scuba
- Zeagle