Diving Safety Manual

Revision October 2022

Preface

The Diving Control Board (DCB) of the University of Arizona (UA) maintains this Diving Safety Manual (DSM) as a requirement of the Scientific Exemption to OSHA 29CFR Subpart T in order to guide its involvement in and management of occupational diving activities. We refer to the Marine Technology Society (MTS) publication "*Code of Practice for Diving Program Management"* for a detailed description of our motivation in adopting the MTS guidelines as the basis for UA's DSM. UA's DSM is a tailored implementation of the MTS Code of Practice which enables integrating the most contemporary best practices from and across multiple agencies, organizations, and regulatory authorities (Navy, NOAA, AAUS, USACE, ADCI, etc.) for diving safety. This approach is adaptable to the broad range of activity and technologies that UA divers engage with and, at the same time, makes significant progress in addressing limitations and shortcomings present within existing individual regulatory approaches.

Acknowledgements

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Revision History

February 2, 2022	Initial draft prepared
October 31, 2022	General revisions and addition of snorkeling appendices.

Contents

Section 1.00 GENERAL INTENT

1.10 Purpose

The University of Arizona (UA) recognizes that *the development and application of diving equipment, technology or related techniques is a scientific field unto itself* ("diving science"). As such, the purpose of this manual is to reinforce the notion that all diving activities associated with the development and application of diving technology and techniques are effectively self-regulated when conforming to scientific exemptions recognized within occupational settings. Of paramount importance and focus is that diving activities be conducted in a manner that maximize safety for the divers, mitigate risks for the host organization, and allow a working reciprocity between diving communities engaged in diving science activities.

This manual serves as a framework for the UA DCB and its divers to address safety, diving project management, risk mitigation, liability, regulatory issues, training, and proficiency when technology and scientific techniques are central to a given diving project.

As diving science progresses, so shall the effort to maintain this manual. The UA DCB assumes a responsibility to review and update this manual to meet or exceed state of the art, safe practices of its diving community.

Scientific Diving Exemption

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

Scientific Diving is defined as:

> *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.*

Exemption Requirements

OSHA has granted this exemption for scientific diving from commercial diving regulations under Appendix B to 29CFR1910 Subpart T, which reads as follows:

> *This appendix contains guidelines that will be used in conjunction with 1910.401(a)(2)(iv) to determine those scientific diving programs which are exempt from the requirements for commercial diving. The guidelines are as follows:*

- *The Diving Control Board consists of a majority of active scientific divers and has autonomous and absolute authority over the scientific diving program's operations.*
- *The purpose of the project using scientific diving is the advancement of science; therefore, information and data resulting from the project are non-proprietary.*
- *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.*
- *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.*

Further, the two elements that a scientific diving program must contain are:

> *1910.401(a)(2)(iv)(A)*
> *Diving safety manual which includes at a minimum: Procedures covering all diving operations specific to the program; procedures for emergency care, including recompression and evacuation; and criteria for diver training and certification.*
>
> *1910.401(a)(2)(iv)(B)*
> *Diving control (safety) board, with the majority of its members being active divers, which shall at a minimum have the authority to: Approve and monitor diving projects; review and revise the diving safety manual; assure compliance with the manual; 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.*

Utility & Applicability

This manual is applicable to all UA diving operations related to the development and application of diving equipment or technology, or the application of scientific techniques for occupational purposes.

Review of Guidelines

As part of the approval of the DCB annual report, any recommendations for modification to this manual will be voted upon by the DCB.

1.20 Operational Control

Host Entity

All diving projects that UA divers engage in will have a designated Host Entity. This may at times be UA, though may also be a collaborative entity.

The Host Entity is defined as the individual, company, institution, or other organizer of the diving science project or program who(m) is connected to the work because of ownership of any equipment used, locations selected, or relationship with the individual(s) concerned.

For the purposes of this manual, a Host Entity of any diving science project or program shall be designated as having operational control over the diving operation. The Host Entity is ultimately responsible for the lawful conduct of the project or program and for meeting any regulatory standards required for its operation that may exceed the scope of this Manual.

This includes all actions and cases involving the operations of employees, volunteers, affiliates, or subsidiary programs where such persons are acting within the scope of their employment or other-directed assignments, as well as the operations of other persons who are engaged collaboratively, cooperatively, or contractually in a diving science project with or for the Host Entity. This broadly encompassing operational control ensures regulatory compliance by employees and ensures that those working with employees have been reasonably vetted to the extent that they may impact the assigned activity of an employee.

Diving Control Board

UA has established a DCB for program governance which shall at all times consist of a majority of active divers. The DCB was organized according to its Charter signed by Betsy Cantwell on May 18, 2022.

The DCB has absolute and autonomous authority over the diving program. When a diving project or program requires expertise outside of the DCB's expertise, subject matter expert consultation will be procured with recommendations considered in so far as such recommendations apply to reinforcing safe practices.

When two or more organizations are engaged in a collaborative research program, one organization will assume the primary responsibilities of the Host Entity (as above). When UA is the host, all participating divers are subject to review and approval according to this manual. When UA is not the host, the UA DCB retains its authority over UA affiliated divers to guide their participation and will work cooperatively with the host's DCB to ensure concerns over reciprocal privileges are addressed.

Diving Safety Officer

The DCB will appoint a Diving Safety Officer (DSO) which serves as a member of the DCB and is responsible for the safe conduct and implementation of the diving safety program.

The DSO shall possess formal leadership training, diving credentials, or demonstrable experience in leading, organizing, and managing diving operations within their community. The DSO must *also* have broad knowledge and experience that encompasses the nature of the diving science taking place under their purview. When projects require practical expertise beyond the DSO's knowledge, the DCB will ensure that the DSO has at their discretion appropriate subject matter consultation or advising to provide recommendations on how to move the project forward.

The DSO may permit portions of this program, such as dive safety oversight for remote field teams over a specified finite duration, to be carried out by a qualified delegate, such as the Lead Diver. However, the DSO may not delegate full accountability for the overall safe conduct and operations of the local diving program. The DSO shall be directed in the performance of the required duties by the DCB, but day to day operational responsibility for the conduct of the local diving program will be retained by the DSO.

Instructional Personnel

All personnel involved in delivering diving instruction to UA divers under the direction of the DCB shall be qualified for the type of instruction being given. Instructional personnel will be selected by the DCB.

Lead Diver

For each dive, one individual shall be designated as the Lead Diver who shall be present at the dive location during the entire diving operation. This Lead Diver is responsible for coordination with other known activities in the vicinity that are likely to impact the safety of diving operations, executing dives according to the pre-determined plan, briefing divers on the pre-determined plan prior to diving, and managing the dive operation for maximum safety and efficiency (including equipment operability, reporting incidents, and suspending operations if needed).

1.30 Consequence of Violation of Regulations by Divers

Failure to comply with this Diving Safety Manual and/or direction of the DSO may be cause for the revocation or restriction of the individual diver's authorization to dive. This determination will be made by the DCB.

1.40 Consequences of Violation of Regulations by UA

UA recognizes that failure to comply with this manual may be cause for the revocation or restriction of the UA's recognition by other organizations, and possibly jeopardize recognition as meeting the OSHA Scientific Diving Exemption.

1.50 Record Keeping Requirements

The DCB should maintain records for all personnel engaged in each project or program. The file should include evidence of diver qualifications, dive record/log sheets, fitness to dive records, reports of disciplinary actions, and other pertinent information deemed necessary.

Health & Safety Plans (HASPs), Dive plans, Activity Hazard Analyses (AHAs), and any related documents supporting the work should additionally be maintained.

The DSO will be responsible for actively maintaining the program files.

Diver File

Each diver is required to maintain a current administrative file with the DSO and should maintain this record personally as part of their measure of responsibility and commitment to occupational diving. Each diver is encouraged to maintain training records, dive logs, medical or fitness to dive records, and other documents to support their experience and verify competency. This information will expedite dive authorizations and reciprocal privileges.

The DSO will furnish to all UA divers the various forms to establish this file and maintain open communications with divers as to when various items may need to be refreshed.

Personal Diving Log

Each UA diver must log every dive made under the control of UA, and is encouraged to log all other dives made outside of UA to be considered as a measure of proficiency. Personal dives will not make up part of any statistics gathering by UA and are only used as a relative measure to gauge activity that speaks to proficiency. Log sheets shall be submitted to the DSO following each dive project to be placed in the diver's permanent file.

The DSO will collate all divers' logs annually to summarize in an annual report to the Dive Safety Committee and will form the basis of any statistics submissions to required regulatory agencies.

A dive log form is provided in Appendix E.

Equipment Service Records

Maintenance of all diving equipment owned or operated by UA, and/or used by project divers should be recorded. The DSO should verify that equipment used by participating individual divers has been maintained according to industry best practices and manufacturer recommendations.

A receipt of equipment service or other record from the service center should be maintained as part of the driver's administrative file, this could be further supported by a standing letter from a local dive shop that is regularly used for rentals. Compressors or other UA dive related infrastructure should be maintained according to manufacturer's recommendations and accompanied by a tag or service record such that end-users can verify its service status.

Required Incident Reporting

All diving incidents requiring recompression treatment, or resulting in moderate or serious injury, or death should be reported to the DCB. The dive-specific incident reporting form provided in Appendix F should be completed, in addition to University incident report forms.

Annual Report

The DSO will prepare an annual report to present to the DCB summarizing the UA's activity for the year. This report should include but is not limited to diving statistics, training conducted, field programs administered, summaries of incidents, and programmatic recommendations to the Committee.

There is no set format for this report, however, report preparers are encouraged to build upon prior reports to ensure consistency in the material presented.

Section 2.00 GENERAL DIVING PROCEDURES

2.10 Introduction

No person shall engage in diving science operations under the control of UA unless they are operating to the provisions of this diving safety manual.

2.20 Dive Planning

The dive planning process should include an analysis of the required tasks and their associated hazards to determine the appropriate equipment (technology) required, and further determine the required qualifications and personnel to perform the tasks. This information should be collated in the form of a Health & Safety Plan (HASP). For routine and recurring activity over time, for instance recurring activity at Biosphere 2 (B2), a master HASP may be established to form the basis of the routine activity.

Task Determination

The task to be conducted during the dive and the nature of the work environment must be clearly defined since the nature of the task within a given environment substantially influences the selection of the most appropriate mode of diving to be employed. Diving modes should be determined as considered best practice for the given task, and this determination shall be made while considering best practices across all diving communities that operate within the given environment or utilize the given diving mode. Diving mode selection must be delineated in the HASP as it impacts all aspects of the dive and project planning.

Equipment Selection

Equipment shall be selected to appropriately employ the defined mode of diving required for the task. Equipment selection should reflect consideration of best practices across communities that operate within the given environment or utilize the given diving mode.

Personnel Determination

When conventional open-circuit SCUBA is utilized, the ‘buddy’ system will be enforced as it is designed to provide mutual assistance, especially in the case of an emergency. A dive buddy refers to an individual within immediate proximity for rendering mutual assistance.

Under unique circumstances, diving with a buddy may present undue risk to the success of an operation; further many modes of diving by their very nature do not include in-water partners such as hookah or surface supplied diving.

Personnel levels will be determined as most appropriate for the mode employed, and as consistent with community best practices and/or regulations. Deviations from established best practices shall be supported with adequate evidence or references and approval by the DCB prior to implementation. Specific procedural changes due to deviations from best practice are a necessary element of any project plan and pre-dive brief by the Lead Diver or Dive Supervisor to the diving team.

Activity Hazard Analyses (AHA)

When a given technology or technique, human interaction with a technology platform, or operation within a specific environment subjects the diver or dive team to risks outside of those conventionally recognized during routine operations, a risk assessment will be conducted in the form of an Activity Hazard Analysis (AHA). The AHA will present actions to be taken to lower the assessed risk, and these actions shall be incorporated into the HASP. A guide to developing AHA's is presented in the Appendix.

Emergency Procedures

The DSO in cooperation with the Lead Diver will develop emergency procedures which follow the standards of care of the community and must include best practices and procedures for emergency care, recompression, and evacuation for each dive location. This may require coordination with a local point of contact or local EMS service. Emergency procedures specific to the project or program should be addressed in the HASP.

Written Health & Safety Plans (HASPs)

All diving projects require preparation of a written Health & Safety Plan (HASP) before field activities start to ensure that the activity is consistent with this manual, other applicable regulations, and that associated risks of the required task have been well evaluated. This HASP is typically prepared by the Lead Diver in concert with the DSO and serves as the master document for managing the diving operation.

A HASP template form is provided in the Appendix. This should be completed and submitted to the DSO for preliminary screening, and then to the DCB for final review and approval. Should a dive plan be rejected by the DCB, specific comments will be provided to inform possible re-submission. The Lead Diver may seek guidance from the DSO to appeal the decision in writing to the DCB. The mutual goal of the Lead Diver, DSO, and DCB should be to work together to address deficiencies in the plan and facilitate safe operations and success in achieving research aims.

Field Dive Plans

Before conducting any diving operations, the Lead Diver will prepare and brief the dive team on the daily/imminent dive plan. This plan will review the HASP, and will then focus on the immediate activity, as follows:

1. Transit to any locations (by small vessel for example)
2. Estimated depth(s) and bottom time(s) anticipated.
3. Specific tasks to be completed.
4. Decompression status and repetitive dive plans, if required.
5. Diver recall signal.

Field dive plans may be verbal, or come in the form of a sign in/out sheet or board depending on the nature of the dive activity. The specific format of the daily dive plan record will be determined by the Lead Diver.

2.30 Diving Procedures

All diving shall take place in accordance with the approved HASP and be consistent with the daily dive plans. Any decision to change the plan by way of scope of work, personnel, or modes is subject to DCB approval. Minor day to day procedural responses to condition changes are subject to DSO approval of the revised dive plan, or may be permitted when local authority is delegated to the Lead Diver. All diving activities will commence keeping the priority on safety of the divers while efficiently completing the required tasks.

Pre-dive Checks

Pre-dive safety checks of the environment, operational footprint, and equipment are the primary responsibility of each diver and should be reviewed in concert with the Lead Diver. These checks may be formal or informal depending on the nature of the operation and as deemed appropriate or required by the given technology utilized or environment being intervened.

Refusal to Dive

It is the diver's responsibility and duty to refuse to dive if, in their judgment, conditions are unfavorable, or if they would be violating the precepts of their training or this manual. No dive team member shall be required to dive against their will. No dive team member shall be required or permitted to dive for the duration of any known condition that is likely to adversely affect the safety and health of the diver or other dive members.

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. The Lead Diver may abort the dive and recall divers with or without cause and such decision shall not be disputed by the diver.

Emergencies and Deviations from Regulations and this Manual

Any diver may deviate from these guidelines or dive plans 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 statement of such actions must be submitted to the DCB explaining the circumstances and justifications. Such a report would be part of an incident report likely indicating a near-miss.

2.40 Post-Dive Procedures

After the completion of a dive, each diver shall report any physical problems, symptoms of decompression sickness, or equipment malfunctions to the Lead Diver. The Lead Diver should report these issues or concerns to the DSO according to adopted procedure.

The Lead Diver should conduct a debrief of the dive for the divers.

Equipment shall be broken down and post-dive maintenance performed accordingly, and all required record-keeping and data transcription completed.

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

Changes in altitude 24 hours before or after diving should be addressed in the HASP.

UA recognizes that diving at Biosphere 2 is at altitude and therefore altitude diving procedures will be identified within each HASP for B2 operations.

Section 3.00 DIVING EQUIPMENT

3.10 General Policy

Equipment shall be selected according to most appropriate mode and configuration to accomplish the task at hand. This decision may be impacted by training, practical experience, and community best practices, however under no circumstance will an inappropriate mode of diving or equipment selection be accepted by the DCB.

Equipment to be employed will be referenced in the HASP and as such is subject to review and approval by the DCB. All equipment shall be regularly examined by the end user, dive team and Lead Diver, and maintained according to manufacturers or DCB's recommendations and procedures. Equipment that is subjected to extreme usage under adverse conditions may require more frequent testing and maintenance.

When new technology or related techniques are employed, decisions to implement will be guided by both activity and equipment hazards analyses to navigate program implementation.

3.20 Air & Breathing Gases Quality Standards

Breathing air shall meet the CGA Grade E specification (or equivalent) as set forth by the Compressed Gas Association (CGA Pamphlet G-7.1). Breathing air produced by UA owned or operated compressors will be tested every 6 months to ensure the Grade E specification is met. This certificate will be posted at the compressor station, with a copy maintained by the DCB/DSO files.

Other gases used for diving shall be verified according to community best practice.

Section 4.00 PROGRAM ENTRY REQUIREMENTS

This section describes the process for a diver to engage in an occupational diving science activity at UA.

4.10 Administrative File

The applicant diver must establish an administrative file with the DSO which constitutes application to engage in the diving program. Many items are verification of qualifications that may lapse over time; as such this file must be maintained, with the onus for maintenance resting with the diver.

In addition to keeping up requisite forms, current copies of the following must be maintained as a portion of a record of training and proficiency:

- Appropriate dive certification(s), records of training, and experience verifications
- Diver Medical Examination or appropriate Fitness to Dive Record
- First aid & CPR certification
- O2 administration certification
- DAN insurance or equivalent dive accident medical coverage
- Proof of dive equipment servicing to manufacturer recommendations

Forms are provided in the Appendix to guide this record keeping.

4.20 Medical Examination or Fitness to Dive Record

All divers are required to have a current medical authorization for diving which declares the individual to be fit to engage in the proposed diving activities.

UA recognizes the work and recommendations of the Undersea & Hyperbaric Medical Society (UHMS) and defer to their diving medical statement form for routine activities. Their current diving medical statement form is provided in the Appendix.

4.30 Classroom/Theory Evaluation

Before authorization to dive, the applicant must demonstrate to the DSO possession of sufficient knowledge of diving theory relevant to the project or operation. The format of this theory demonstration may be determined by the DCB – DCB should consider accepting norms from past training when ongoing proficiency has been maintained.

4.40 Practical Evaluation

Before final authorization to dive, the applicant must demonstrate to the DSO that they possess sufficient skill and proficiency in the field to participate in the project or program. The nature of the practical evaluations should be guided by the DCB, and while considering the nature of the local diving operation. The format of this practical evaluation may be determined by the DCB. A checklist/guide is provided in Appendix B.

4.50 Waiver of Requirements

The DSO may grant a waiver for specific requirements of training, examinations, and minimum activity to maintain an authorization to dive after careful review of these requirements and a consensus agreement by the DCB while considering the experience history and proficiency of the applicant. Such waivers will be considered on a case-by-case basis.

Section 5.00 DESIGNATED DIVER AUTHORIZATIONS

No person shall engage in the organized diving project unless that person is authorized by the DCB. Only a person diving under the control of the DCB is eligible for a diving authorization for the DCB. Authorization to dive may be granted with distinctions and restrictions.

5.10 Authorization Types

Authorization types do not necessarily represent a pathway of inexperience towards experience, rather they signify the relative designation to which the diver has been vetted for participation in a dive project for the given scope. For example, a novice diver may be considered a Diver in Training for relatively routine shallow water tasks and then progress through towards proficiency allowing them to serve as a Lead Diver for similar work. In the event this Lead Diver seeks to participate in a highly technical project, outside of their current training or proficiency, they may be designated as a Diver in Training for the new technical program. These designations are therefore specific to the project or program tasking and considered on a per project basis within the occupational setting.

Diver in Training

This designation signifies that a diver applicant is in the process of completing program entry requirements defined in Section 4.0 and authorizes the diver to participate in a project under the direction of a Lead Diver, and within practical limitations defined by the DSO. A diver-in-training is effectively undergoing on the job training through mentorship with senior personnel.

Active Diver

This designation represents authorization to engage in diving according to an approved dive plan while working in concert with another active diver(s) or Lead Diver. This qualification requires meeting all program entry requirements, and demonstration of any additional training and proficiency required to meet mission objectives.

Lead Diver or Dive Supervisor

This designation authorizes the individual to lead and/or supervise dive events and operations on behalf of the DSO. Documented leadership experience in the given environment, or while conducting the designated task is required; and formal dive leadership training is recommended. The Lead Diver must demonstrate sound judgment and the ability to responsibly manage a dive operation to the DSO.

Temporary Diver Permit

This permit constitutes a waiver of the partial requirements and is issued by the DSO after his/her being convinced that the person in question has demonstrated proficiency in diving and can contribute measurably to a planned dive. It is valid only for a limited time. This permit is not to be construed as a mechanism to circumvent any requirements for dive authorization. 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.

Reciprocity and Verification of Qualifications

To facilitate cooperation among and between diving science projects or programs, the DSO may provide a written 'Verification of Qualifications' to the Host Entity on behalf of the UA diver as a concise summary of their diving background to expedite review and acceptance for the project. This letter/form also serves as cover for the diver's administrative file maintained with the DSO.

A DSO provided Verification of Qualifications in no way guarantees approval to dive for the receiving Host Entity – it is simply a mechanism to exchange pertinent information and guide DSO decision making towards acceptance. Similarly, UA may receive a Verification of Qualification letter or 'Letter of Reciprocity' for its review of a visiting diver. This information is used to guide authorization to dive decision making but in no way waives or circumvents the DSOs responsibility to vet the visiting diver to UA requirements. A Verification of Qualifications form is provided in Appendix D.

5.20 Continuation of Diving Authorization

During any 12-month period, each authorized diver must maintain their administrative file, including keeping up to date all qualifications that may expire. A minimum level of activity to maintain diving proficiency of 12 dives per year is highly recommended. Failure to meet these requirements may be cause for revocation or restriction of authorization.

5.30 Revocation of Authorization

A diving authorization may be revoked or restricted for cause by the DSO or the DCB. Violations of regulations set forth in the applicable standards or adopted guidelines, 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 in writing for reconsideration and/or re-certification to the DSO and the DCB. All such written statements and requests, as identified in this section, are formal documents, which will become part of the diver's file.

5.40 Re-authorization

If a diver's authorization expires or is revoked, they may be reauthorized 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.

Section 6.00 TRAINING AND PROFICIENCY

When reviewing diver qualifications and requests to dive, past training and ongoing proficiency from the diver's history should be considered and given merit towards the diver's UA credentials.

Dive training in all communities and at all skill levels benefits immeasurably through mentorship; as such, upon program entry divers who are novice or new at any given skill level or for a given mode can participate in projects for educational purposes under supervision to the extent they will measurably contribute to the project objectives without placing undue risk on the project's divers. This on-the-job training is critical to promote ongoing training and proficiency within an occupational diving regimen.

6.10 Initial Active Diver Verification

One-hundred hours is widely recognized as a minimum experience benchmark for scientific diving qualification, aligns well with introductions to other occupational diving training regimens, and as such is presented in this manual as an example trajectory towards becoming authorized as an 'active diver'. These 100 hours include the effort to meet program entry requirements – administrative, theoretical aspects, and practical dive training, as well as on the job training. A minimum of 40 hours of on-the-job training under the mentorship of a Lead Diver/DSO affords the opportunity for an entry level diver to demonstrate competency with the given diving mode towards being authorized as an active diver for comparable projects in the future.

Thereafter, an active diver assisting entry level divers through a 100-hour cycle and demonstrating leadership capabilities may then be designated as a Lead Diver for comparable dive tasks.

This progressive and recurring verification of training and experience can initially be undertaken as a dedicated course of study (such as a semester academic course program), or may be verified through the culmination of multiple independent training programs or experience at the discretion of the DCB.

Note however that this 100-hour regimen does not only apply to novice divers seeking to enter an occupational diving program. This structure also serves as a model pathway for formal training and mentorship through advanced skill sets and for specific technology and techniques.

Sample Training Regimen to meet 100 hours of training		
Requirements	**Time Allocation**	**Opportunities**
administrative compliance		
work with DSO to satisfy all admin requirements	3-4 hours	
diver interview/orientation with DSO written exam	2 hours	
practical requirements		
entry-level diver training (typically Basic Scuba)	30 hours	basic scuba most agencies
swim/watermanship test	2 hours	administered by DSOor delegate
1st aid, CPR, O2 administration for diving	6 hours	DAN, CPROx1stAED, Red Cross, similar
dive accident management/rescue diving techniques	15 hours	standard Rescue Diving course, with practical reflecting work environment
occupational diving techniques (this includes minimum 12 dives for 6 hours dive time)	40 hours	On the Job Training conducted through mentorship in the field, with support from DSO or other qualified teaching assistants
		may include pertinent Advanced or Specialized Diver Training (Nitrox, Deep Diving, Drysuit Diving, Underwater Photography, Advanced Navigation, etc)
final evaluation	2-3 hours	DSO one on one as needed
TOTAL	**100 hours**	**results in authorization as an active diver**

Figure 1: Sample 100-hour training regimen for initial verification of training.

6.20 Training for Specific Environments

A diver may work under the auspices of UA within the depths and environments for which training and proficiency can be reasonably accounted for. Authorization for a given depth or environment should be granted only upon approval of a dive plan that accounts for management of recognized risks. Formal training for specific environments will be carried out by DSO approved Instructional Personnel and to recognized community best practices or standards that best meet the requirements of the diving operation. After completion of training, the diver must demonstrate to the DCB a degree of proficiency and sound judgment to perform work within the scope of the newly acquired skills and capabilities.

The following specific environments are broadly considered and warrant distinct considerations for authorizations to dive. A dive environment may fit one or more of these descriptions.

6.21 Confined water diving

Confined water diving is considered any dive within a pool, test tank, or similar controlled environment in which multiple modes of diving are relevant depending on the nature of the task. Confined water diving is commonly considered as a starting point for all diver training, often preceding Openwater diving, though occupational tasks and task rehearsals/mock-ups are also conducted in confined water.

6.22 Openwater diving

Openwater diving is considered any dive within the ocean or various freshwater bodies in which multiple modes of diving are relevant depending on the depth and nature of the task. Openwater diving is commonly considered as a starting point for all diver training, when following confined water training.

6.23 Deep Diving

Deep diving is considered any dive depth from which the diver cannot perform an emergency swimming ascent comfortably and with confidence which indicates redundant life support measures must be in place.

6.24 Cave and Cavern Diving

Cave and cavern diving is considered any dive where a diver enters a natural underground formation that is submerged or partially submerged and which prohibits a direct and immediate ascent to the point of entry. Caverns differ from caves in that sunlight is readily visible which help direct divers to the point of entry/exit.

6.25 Blue or Black Water Diving

Blue water diving is defined as diving in mid-water where the bottom is not within sight. Similarly, black water is this same environment, though at night.

6.26 Ice and Polar Diving

Ice diving is defined as diving through or beneath ice which may prohibit a direct and immediate ascent to the point of entry, and where special consideration must be given to diver thermal management.

6.27 Aquarium Diving

Aquarium, mesocosm, or exhibit diving presents unique circumstances including but not limited to close quarters, shallow water, close proximity to aquatic life, structural entanglements, in takes and other flow conditions which require specialized training and procedures. A Biosphere 2 Ocean HASP template is included in Appendix A.

6.28 Offshore Industrial Diving

Offshore Industrial diving is defined as diving in, around, or near offshore infrastructure such as but not limited to pipelines, cable installations, oil or gas infrastructure, or other industrial structures.

6.29 Inshore Industrial Diving

Inshore Industrial diving is defined as diving in, around, or near inshore infrastructure such as but not limited to ports, harbors, marinas, or other industrial facilities with submerged infrastructure such as hydro facilities, aqueducts, wastewater facilities, or similar.

6.291 Overhead Environments & Confined Spaces

Overhead and confined space environments present unique operational hazards that may vary considerably from cave and cavern diving, but often require similar redundancies for controlled intervention.

6.292 Contaminated Water Diving

Contaminated water presents unique operational hazards that occur from the exposure to bacteria, viruses, nuclear or radioactive waste, construction slurries, sewerage, fuel, oil, or other fluid mediums that require significant efforts to shield the diver from the hazardous environmental exposure.

6.293 Potable Water Diving

Potable water presents unique operational circumstances that require mitigating contamination of the environment and as such the diver and all equipment must undergo a cleaning or decontamination procedure prior to entry. The diving at times requires entry into a confined space such as tunnel, shaft, pipe, or storage tank.

6.30 Training for Specific Dive Modes

A diver may work under the auspices of UA using specific dive modes for which training, and proficiency can be reasonably accounted for. Authorization for a given diving mode will be granted upon approval of a dive plan that accounts for management of recognized risks. Formal training for specific diving modes use will be carried out by authorized Instructional Personnel and to recognized community best practices or standards that best meet the requirements of the diving operation. After completion of training, the diver must demonstrate to the DCB a degree of proficiency and sound judgment to perform work within the scope of the newly acquired skills and capabilities.

The following specific dive modes warrant individual consideration.

6.31 Open Circuit SCUBA

Open Circuit Self-Contained Breathing Apparatus (SCUBA) is widely accepted as the most common mode of diving and is often the point of entry for occupational diving training in both commercial and science sectors. It is commonly used throughout many diving communities.

6.32 Rebreather Diving

Rebreather diving involves specialized equipment that recycles the diver's breathing media to provide a variety of physical and physiological benefits. Rebreather diving includes oxygen only rebreather systems, semi-closed-circuit rebreathers, and fully closed-circuit rebreathers. Rebreathers may be self-contained or included as a component of a tethered system.

6.33 Surface Supplied Diving

Surface Supplied diving involves 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 is typically dependent on a surface-based dive team, i.e., topside, which varies in size and composition based on community best practices.

6.34 Hookah Diving

While similar to Surface Supplied diving in that the breathing gas is supplied from the surface by means of a pressurized hose, the supply hose often 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 self-monitoring depth, time, diving profile, and assumes responsibility for tether management.

6.35 Staged Decompression Diving

Decompression diving shall be defined as any diving during which the diver cannot perform a direct return to the surface without performing a mandatory decompression stop to allow the release of inert gas from the diver's body.

6.36 Saturation Diving

Saturation diving involves the diver saturating their tissues with inert gas at a given depth and thereafter often residing at that depth or pressure until the mission is carried out. Typically, lengthy decompression in a controlled environment follows.

6.37 Atmospheric Diving

Atmospheric Diving involves utilizing a personal submersible, hard suit, or other one-atmosphere enclosure to protect the human from the effects of ambient pressure greater than one atmosphere. The diver [pilot] is individually responsible for his/her well-being during the dive. By contrast, a passenger submarine would be considered a manned undersea vehicle (MUV), and as such not considered categorically to be atmospheric diving.

6.38 Diving with ROVs or other subsea robotics

Personnel diving in concert with or augmented by ROVs, or other subsea robotics including autonomous vehicles, presents unique operating hazards, which may vary depending on the mode of diving utilized. This includes diving in proximity to a robotic system in place for observation only, and/or diving while interacting with the robotic system.

6.39 Other Diving Technology

Certain other types of diving technology that impact the safety or well-being of the diver may require training and/or specialized operational procedures. Broadly accepted community best practices will be reviewed and adopted for the given project.

6.40 Training for Specialized Breathing Media

A diver may work under the auspices of UA using breathing media for which training, and proficiency can be reasonably accounted for. Authorization for a given breathing media will be granted upon approval of a dive plan that accounts for management of recognized risks. Formal training for specialized breathing media use will be carried out by a DSO approved Instructional Personnel and to recognized community best practices or standards that best meet the requirements of the diving operation. After completion of training, the diver must demonstrate to the Committee a degree of proficiency and sound judgment to perform work within the scope of the newly acquired skills and capabilities.

The following breathing media are considered ‘specialized’ and warrant consideration beyond very routine air diving operations by way of their handling, dive operational considerations, and their physiological impacts on the diver.

6.41 Nitrox Diving

Nitrox is defined for these guidelines as breathing mixtures composed predominately of nitrogen and oxygen, where the oxygen fraction is elevated and is most commonly produced by the addition of oxygen or the removal of nitrogen from air.

6.42 Mixed Gas Diving

Mixed gas diving is defined as dives done while breathing gas mixes containing proportions greater than 1% by volume of an inert gas other than nitrogen. Heliox and trimix are two examples of those breathing media considered mixed-gases.

6.43 Pure Oxygen

Pure oxygen, typically accepted as 98% or greater by volume, is used in multiple ways including but not limited to accelerating decompression, first aid administration, and within closed-circuit breathing devices.

6.50 Development of Training Programs

When a required course of training is needed to prepare divers for a novel environment, specialized breathing media, or new diving technology or diving mode and there are no such well-established courses of training within a respective expert community that can be readily adopted, or such an existing course requires adaptation to best fit the application, a training program may be developed by UA which may in part involve on-the-job training when appropriate. When the training involves the use of new diving technology, the inventor or manufacturer of the technology or product should be consulted to develop an appropriate training regimen. If the manufacturer does not or cannot provide direction on training practices, UA may develop a training regimen, should engage subject matter expert consultation, and should seek counsel on any associated liabilities. Developed courses should be backed up by technical reference to applicable existing standards or community best practices.

This manual proposes that developed courses are organized to the below well recognized outline (credit: adapted from International Training Inc.).

NAME of TRAINING PROGRAM

Introduction
Include an overview of the course and its purpose.

Who May Teach
Describe instructor qualifications required.

Student to Instructor Ratio

> **Academic**
> Unlimited, so long as adequate facility, supplies, and time are provided to ensure comprehensive and complete training of the subject matter
>
> **Confined Water (swimming pool-like conditions)**
> List maximum number of students per instructor and/or with assistants.
>
> **Open Water (ocean, lake, quarry, spring, river, or estuary)**
> List maximum number of students per instructor and/or with assistants; it is the instructor's discretion to reduce this number as conditions dictate.

Student Prerequisites
Detail the minimum qualifications required to enroll.
Detail the minimum age required to enroll (including age with parental consent if applicable).
Detail the minimum verifiable experience required to enroll.

Course Structure and Duration

Details of confined or open water execution of dives are required, all with brief/debrief by Instructional Personnel.

Detail the minimum number of classroom hours if applicable.

Detail any restrictions on the dives, i.e., max depth, time, etc., if applicable.

Administrative Requirements

Administrative Tasks

Collect the course fees from all the students as applicable.

Ensure that the students have the required equipment.

Communicate the schedule to the students.

Have the students complete the applicable Liability Releases and Waivers.

Verify any required medical requirements.

Upon successful completion of the course, the instructor must

Issue the appropriate verification of training to the student, employer, and/or certifying body.

Required Equipment and Materials

Detail the minimum equipment requirements and materials for the course.

Approved Outline

Instructors may use any additional text or materials that they feel help present these topics.

Academic - The following topics must be covered

Detail all main subject areas to be covered, including sub-topics as applicable. Detail any academic requirements.

Practical - Required Skill Performance

Detail each required dive, by Number – i.e., Dive 1, Dive 2, etc., and list all required skills.

6.60 Proficiency

All occupational divers must attain and maintain proficiency in the environments, with the breathing media, and for the modes of diving they will employ during their work. At a minimum, 12 dives per year are highly advised to maintain an active file. This number of dives is adopted from the current scientific community consensus and represents the effort to go through the process of a dive once per month to maintain a very minimal level of activity. It is recognized that specialized diving circumstances cannot always be foreseen and therefore work-up proficiency regimens may be employed to reconstitute proficiency according to a HASP to minimize operational risks to the divers and diving project.

The DCB in no way recognizes that 12 dives/year asserts a degree of proficiency in most occupational environments, and only serves to demonstrate a commitment to minimal activity. Divers must demonstrate competency prior to being assigned underwater tasks.

The UA DCB recognizes that diving proficiency regimens and routine diving activity may lapse from time to time due to any number of circumstances including personal or family health and well-being, pregnancy, financial hardship, or any similar reason. These lapses are in no way cause for revocation of diving privileges and the DCB is committed to proactively facilitating a return to diving with appropriate administrative file upkeep, medical clearances, and establishing a proficiency regimen to return to diving safely.

Appendices

Appendix A: Dive Planning and Risk Assessments

All diving carries inherent risks. These are mitigated through technology, its techniques for use, training and proficiency in these techniques, and further understanding when it is most appropriate to apply one technology mode versus another for the given diving task and/or within the specialized environment.

Risk mitigation guidance will be directed through a Health & Safety Plan (HASP) that will be prepared for each diving activity. A master plan may be prepared for activities which are routine and recurring (such as B2), though this should be reviewed as part of the pre-dive briefing to note any required changes.

Over time, many risks become considered routine and are mitigated through standard conventions within given diving communities. When risks are identified for a given task that are not well understood by the DCB, or are cause for acute attention (differential pressure (delta P) for example), they must be analyzed as part of the dive plan. An Activity Hazard Analysis (AHA) is an appropriate mechanism to make safety decisions and further guide actionable directions.

A dive HASP template is enclosed, along with a sample AHA format. AHAs should be collated and maintained for ongoing analysis and guiding future dive safety policies and procedures.

Health & Safety Plan (HASP) Template

1. **Description of the proposed work.**

2. **Location(s) of proposed dives.**

3. **Qualifications for each diver including documentation of applicable training and proficiency for the given dive(s) (attach or reference to Project Diver Checklist).**

4. **Approximate number of proposed dives with specified tasks.**

5. **Description of technology and/or techniques employed to perform specified tasks.**

6. **Specific hazardous conditions anticipated, including unique hazards associated with the adoption of a specific technology, related technique, or within a unique operating environment (Use AHA template when needed).**

7. **Any post-dive immediate equipment maintenance, or securing of material, and/or record keeping requirements.**

8. **Emergency plan with the following information:**

    a. **Method of diver recall.**

    b. **Nearest operational recompression chamber.**

c. Nearest accessible hospital.

d. Available means of transport.

e. Name, telephone number, and relationship of person to be contacted for each diver in the event of an emergency.

Method of Diver Recall

Prior to commencing the dive, the Lead Diver will establish a means to signal termination of the dive and verify location and access to emergency oxygen. Victim will be extracted from the Ocean and taken onto the beach via the emergency dive path.

Emergency Oxygen Location

Oxygen kit is located just under the bench on the B2Ocean pier but should be placed on the beach prior to diving.

Request Energy Center to respond with AED if victim is unconscious. Energy Center (520-621-3949) will be contacted via phone or radio and told of the emergency situation and to prepare for the arrival of EMS. The nearest landline is located on the pier (520-621-3768), and Biosphere 2 staff have handheld radios on their person or on the beach.

Script for Energy Center: "Energy center, we have a diving accident emergency, we have called OR call 911 and bring an AED and first aid kit."

Activation of EMS/Available Means of Transport

The nearest landline is located on the pier: (520) 621-3768

Local EMS	dial 911
DAN Emergency Service	1-919-684-9111

Script for EMS: "Hello, we have had a scuba diving-related incident. The victim is at the Biosphere 2. Use gate code 3333 to get in. Someone will meet you at the gate and direct you in. Optional: We are providing care, such as oxygen or first aid, to the victim. Thank you."

911/EMS vehicles have access via the Savannah Airlock. Emergency personnel will be guided by Biosphere 2 staff to beach for transport.

Nearest operational recompression chamber

Facility: St. Joseph's Advanced Wound Healing, Phoenix AZ (St. Joseph's Hospital and Medical Center).
Address: 124 W Thomas Rd. Ste. 103, Phoenix AZ, 85013
Phone: Business – (602) 406-4325 7AM-3:30PM M-F.
Hospital – (877) 627-7295

Nearest Accessible Hospital

Oro Valley Hospital
1551 E Tangerine Rd #329
Oro Valley, AZ 85755
(520) 901-3500

Leaving Biosphere 2 Rd, turn left onto AZ-77S. Turn right onto E Vistoso Commerce Loop Rd. Continue onto E Innovation Park Dr. Turn right. Turn left. Turn Right. Destination will be on the right.

ccuh

Primary Emergency Response for all locations

Sequence of steps to follow in an emergency:

1. **Stop. Think. Breathe. Act.**
2. **Assess the situation**

Ensure there are no hazards to yourself as the rescuer before approaching the victim.

3. **At surface**
    a. **Approach** looking for signs of panic
    b. **Evaluate:** stop out of reach and tell victim to inflate BCD and put snorkel in their mouth
    c. **Assist and transport** if the diver is responsive, **reassure** the diver.
    d. If the diver is panicked, make contact from behind or underwater and establish buoyancy for you and the victim before towing.
4. **If underwater**
    a. Establish responsiveness: wave hand in front of mask and do a gentle shake of the arm
    b. **Leave regulator in mouth** and hold in place from behind
    c. Use the victim's BC to control ascent, ditch victim's weight only if necessary to get them to the surface.
    d. At surface— inflate victims BC, inflate your BC, if victim is wearing a weight belt ditch it
    e. Tow to beach path using the do-si-do supporting victims head and **maintaining the airway**
    f. Ditch your gear and prepare victim for extraction by unclipping all of their gear
    g. Extract using packstrap method or modified crawl
5. **Secondary assessment:**
    a. Lie victim down
    b. **Radio Energy Center:** "Energy center, we have a diving accident emergency, call 911 and bring an AED and first aid kit"
    c. **Primary Assessment:** look, listen, feel, check pulse, check breathing
    d. **Administer O_2 always.** Even if emergency response is delayed, give 15 L/min until supply runs out.
    e. **Start with 2 rescue breaths, then 30 chest compressions, and repeat until EMS arrives or someone else relieves you.**
    f. **Check for bleeding.** Assess skin color, temperature, and moisture on the face and abdomen
    g. **Manage shock**
6. **Missing diver:**

a. Call **EMS**
b. Assign **spotters** to look for bubbles
c. Determine if the diver may have **left**
d. Assign qualified divers to search

Activity Hazard Analysis/Risk Assessment Template

Activity	Hazards Identified	Actionable Decision to Mitigate Hazards
diving in XYZ environment		
diving with XYZ equipment/technology		
diving to performing XYZ operation		

Appendix B: Program Management Checklists

The following checklists should be used to guide establishment of administrative files, direct program development, and subsequent compliance with applicable regulatory bodies.

Checklist for UA and Host Entity Self-Evaluation

The Host Entity is the organization taking the lead for project management and generally executing the project. It may or may not be UA for all project UA divers are engaged with. The Host may or may not have a formal diving safety program, however, at a minimum the following organizational elements should be in place, or implemented by UA, and verified by the DCB:

- ❑ Establish the diving objective for the advancement of diving science and/or related data gathering.
- ❑ Develop and put in place a Diving Safety Manual consistent with this guideline and meeting applicable regulatory requirements.
- ❑ Assemble a Diving Control/Safety Board comprised of experts in the technologies and techniques to be utilized.
- ❑ Appoint a Diving Program Manager, Diving Safety Officer, or similar responsible for overall risk management and site safety.
- ❑ Designate Lead Divers or Diving Supervisors to oversee the field operations.
- ❑ Establish a mechanism for vetting divers' qualifications for projects consistent with these guidelines.
- ❑ Prepare a HASP for each project and conduct diving activity according to plan.
- ❑ Establish administrative, record-keeping, and general operating practices consistent with these guidelines.
- ❑ Recognize that all dives are conducted at will; convey to each individual diver the authority to determine when to abort the dive.

Checklist for Project Divers

Divers applying for approvals to dive on a project should maintain a diving portfolio to support their application. At a minimum, this should include the following:

Entry-level divers / all divers

- ❑ Applicant/diver CV/summary
- ❑ Current medical clearance for diving
- ❑ Demonstration or verification of watermanship safety
- ❑ Verification of training in an appropriate diving mode
- ❑ Copies of dive logs to demonstrate proficiency
- ❑ Maintenance records for any personal equipment to be used on the project

Active Divers (in addition to above)

- ❑ Verification of training in basic emergency response – first aid, CPR, O2 administration
- ❑ Verification of training in dive accident management/dive rescue
- ❑ Documentation of at least 40 hours of on the job training or related experience
- ❑ Verification of additional training and proficiency applicable to the project or program

Lead Divers / Dive Supervisors (in addition to above)

- ❑ Verification of appropriate leadership training or comparable experience
- ❑ Verification of at least 100 hours of occupational diving project experience applicable to the project or program (ex. assistance to or mentorship through a complete 100-hour regimen)

Checklist for Verification of Watermanship and Diving Safety

The DCB must verify that an applicant diver is proficient in watermanship and diving safety. Verification may be through assessment of past experience and current activity and/or through a formal check-out dive process with the DSO or designee. The following activities and skills are a guideline though do not reflect requirements for all modes, in all environments, nor for all tasks undertaken, and therefore specific verification requirements may vary at the DCB's discretion.

Academic

- ___ Knowledge of applicable diving standards and regulations
- ___ Pre-dive planning, briefing, site orientation, and buddy check
- ___ Use of dive tables and/or dive computer
- ___ Equipment familiarity
- ___ Underwater signs and signals
- ___ Proper buddy contact
- ___ Monitor cylinder pressure, depth, bottom time

Swim skills

- ___ Surface dive to 10 ft. without scuba gear
- ___ Demonstrate watermanship and snorkel skills
- ___ Surface swim without swim aids (400 yd.)
- ___ Tread water without swim aids (10 min.), or without use of hands (2 min.)
- ___ Transport another swimmer without swim aids (25yd)

Basic Diving

- ___ Entry and exit (pool, boat, shore)
- ___ Mask removal and clearing
- ___ Regulator removal and clearing
- ___ Surface swim with scuba; alternate between snorkel and regulator (400 yd.)
- ___ Neutral buoyancy (hover motionless in mid-water)
- ___ Proper descent and ascent with B.C.
- ___ Remove and replace weight belt while submerged
- ___ Remove and replace scuba cylinder while submerged
- ___ Alternate air source breathing with and without mask (donor/receiver)
- ___ Buddy breathing with and without mask (donor/receiver)
- ___ Simulated emergency swimming ascent
- ___ Compass and underwater navigation
- ___ Simulated decompression and safety stop

Rescue

- ___ Self rescue techniques
- ___ Tows of conscious and unconscious victim
- ___ Simulated in-water rescue breathing
- ___ Rescue of submerged non-breathing diver (including equipment removal, simulated rescue breathing, towing, and recovery to boat or shore)
- ___ Use of emergency oxygen on breathing and non-breathing victim
- ___ Accident management and evacuation procedures

Appendix C: UHMS Diver Medical Statement

Appendix D: Verification of Qualifications

Appendix E: Dive Log Form

The following divelog format should be used to collate and submit divelogs to the DSO/DCB for recordkeeping purposes. Dives requiring more complex planning, such as staged decompression, should have their plans/profiles archived with the associated HASP. Divers are encouraged to maintain the divelog as a spreadsheet for each of submission.

			mode:	gas:	special env.:	deco plan:		purpose:					
			open circuit SCUBA	air	confined water	table		research					
			rebreather (specify)	nitrox (%)	openwater	computer		training&proficiency					
			surface supplied	mixed gas (%)	deep	software							
			hookah	oxygen	cave or cavern								
			other (specify)		bluewater								
					ice or polar								
					aquarium								
					offshore industrial								
					inshore industrial								
					overhead or confined space								
					contaminated water								
					potable water								

name	date	location	mode	gas	special env.	deco plan	affiliation	purpose	buddy	boat/shore	max. depth (ft.)	time (min.)	notes
Last Name, First Name		Name of dive site, city, state, country											

Appendix F: Incident Reporting Form

All diving incidents requiring recompression treatment, or resulting in moderate or serious injury, or death shall be reported to the DSO who will prepare a report. The report will specify the circumstances of the incident and the extent of any injuries or illnesses. This form is confidential and for statistics purposes only. The DCB must review and release this report before it is submitted to other agencies or authorities as required. Check the appropriate space(s) & complete the form:

___ Simple Illness ___ Referred to Physician ___ Serious injury

___ Barotrauma ___ Hyperbaric Treatment ___ Near Drowning

___ Hyperoxic ___ Hypercapnea ___ Fatality

___ Other

•Workers' Compensation Claim Yes ___ No ___

Descriptive Report (use additional sheets or reverse if necessary)

Date of Incident:

Please describe incident and immediate actions taken:

-Circumstances and the extent of the injuries or illnesses:

-Treatment provided and results:

-Recommendations to avoid repetition of incident:

Name & Title of Person Submitting Report

_____

Signature_____ Date_____

Appendix G: Snorkeling

Safety oversight of scientific snorkeling is maintained by the DCB, and may occur with approvals of the DSO. Individuals authorized as UA Scientific Divers may participate in scientific snorkeling projects. Non-divers must complete the UHMS Diver Medical Statement (Appendix C) and a swim check out. The swim check out must follow the guidelines detailed in Appendix B, and may be conducted by a UA Campus Rec lifeguard or another individual if approved by the DSO.

UA's Scientific Snorkel policy requires that:

1. A Snorkel Health and Safety plan (Appendix A)for each project must be submitted to the DSO for approval.
2. A topside spotter trained in water rescue techniques must accompany snorkelers while in the water.
3. A radio and/or phone and emergency O_2 must be available onsite.
4. Breath holding (freediving) to conduct underwater tasks is prohibited; tasks requiring the person to remain underwater will be conducted by quailed UA divers.

Health & Safety Plan (HASP) Template

1. **Description of the proposed work (including dates and location).**

2. **Applicable swim and snorkel experience.**

3. **Specific hazards anticipated.**

4. **Safety measures in place.**

UA Snorkel Skills Checkout

_____ _____
NAME DATE

___ Surface dive to 10 ft. without scuba gear
___ Demonstrate watermanship and snorkel skills
___ Surface swim without swim aids (400 yd.)
___ Tread water without swim aids (10 min.), or without use of hands (2 min.)
___ Transport another swimmer without swim aids (25yd)

_____ Signature (UArizona Lifeguard/Other)

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