

## Underwater Blasting. Risk Assessment

Business Name:		ABN:
Business Address:		
Contact Person:	Phone:	Email:

### THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THE PROJECT

Under the Work Health and Safety Regulation (WHS Regulation), a person conducting a business or undertaking (PCBU) is required to ensure that a RISK ASSESSMENT is prepared before the proposed work starts.

Full Name:		
Signature:	Title:	Date:

### CLIENT OR PRINCIPAL CONTRACTOR DETAILS

Client:	SCOPE OF WORKS
Project Name:	
Project Address:	
Project Manager:	
Contact Phone:	
Date Risk Assessment supplied to Project Manager:	

RISK MATRIX									
LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION	HIERARCHY OF CONTROLS	
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE			<b>Elimination</b> Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	<b>Substitution</b> Replace the hazard.	
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Review before work starts.	Isolation Isolate People from the hazard	
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	2M MODERATE	Ensure control measures in place.	<b>Engineering</b> Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	<b>Administrative</b> Change	
								<b>PPE</b>	
<b>Risk Rating &amp; Required Action:</b>								<b>Notes on Hierarchy of Controls:</b>	
4A		Stop work. The risk is intolerable. Eliminate the hazard or redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or higher-level authorisation is required.						Remember to apply controls in the preferred order shown by the coloured pyramid:	
3H		Review and approve additional controls before task starts. Senior supervisor sign-off needed.						1. <b>Eliminate</b>	
2M		Ensure all nominated controls are in place and effective. Proceed with caution; monitor conditions.						2. Substitute	
1L		Proceed, following standard operating procedures. Monitor and keep records.						3. Isolate	
								4. Engineering	
								5. Administrative	
								6. PPE	
<b>Consequence Scale:</b>								Always document <b>why</b> a lower-order control is accepted if elimination or substitution is not reasonably practicable.	
Consequence	People (injury/illness)		Project / Assets		Compliance / Reputation				
Catastrophic	Fatality or permanent total disability		project shutdown		Significant regulator intervention; criminal prosecution				
Major	Serious injury/illness (hospital > 5 days)		critical delay		Improvement notice; major media coverage				
Moderate	Medical-treatment injury; lost-time > 1 day		moderate delay		Minor breach; adverse client comment				
Minor	First-aid only, no lost time		negligible delay		Isolated non-conformance				
Insignificant	No injury		no schedule impact		Deviation caught and corrected on site				
								<i>aligned with Safe Work Australia's Managing the risk of fatigue at work (2023) and ISO 45001:2018 clauses 6–8.</i>	

JOB STEP	POTENTIAL HAZARDS	IR	CONTROL MEASURES	RR
SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
1. Site Assessment	Poor visibility, Marine wildlife	3H	<ul style="list-style-type: none"> <li>- Conduct a site survey with experienced divers.</li> <li>- Utilise sonar technology for underwater mapping.</li> <li>- Coordinate with marine biologists to assess wildlife presence.</li> <li>- Ensure clear communication protocols are in place. Use marking buoys to define work boundaries.</li> <li>- Plan work schedules to minimise environmental impact.</li> <li>- Use underwater lighting systems.</li> <li>- Implement environmental monitoring throughout the operation.</li> <li>- Install wildlife deterrents if legally permissible.</li> <li>- Liaise with local environmental agencies.</li> <li>- Schedule work during times of reduced wildlife activity.</li> <li>- Employ experienced divers with knowledge of local conditions.</li> </ul>	2M
2. Equipment Preparation	Equipment failure, Inadequate maintenance	3H	<ul style="list-style-type: none"> <li>- Regularly inspect and maintain all equipment according to manufacturer specifications.</li> <li>- Perform pre-blast equipment tests.</li> <li>- Ensure spare parts are readily available.</li> <li>- Conduct training on equipment handling and troubleshooting.</li> <li>- Use equipment with a proven track record in similar conditions.</li> <li>- Maintain an equipment logbook for all inspections and repairs.</li> <li>- Use personal protective equipment appropriate for underwater use.</li> <li>- Implement a preventative maintenance schedule.</li> <li>- Ensure all gauges and instruments are calibrated.</li> <li>- Use equipment from reputable suppliers only.</li> <li>- Conduct a risk assessment specific to equipment safety.</li> </ul>	1L
3. Blasting Material Handling	Improper handling, Exposure to explosive materials	4A	<ul style="list-style-type: none"> <li>- Train staff in safe handling practices for explosive materials.</li> <li>- Use certified containers for explosive materials.</li> <li>- Implement strict inventory control measures.</li> <li>- Maintain material safety data sheets for all substances.</li> <li>- Segregate incompatible materials during storage and transport.</li> <li>- Follow legal guidelines for explosive materials handling.</li> <li>- Regularly audit handling procedures for compliance.</li> </ul>	2M

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			<ul style="list-style-type: none"> <li>- Employ specialised personnel for transport and handling. - Carry out rigorous checks before and after transport.</li> <li>- Ensure secure and dry storage conditions.</li> <li>- Supervise loading and unloading procedures.</li> <li>- Establish emergency response plans for material spill or mishandling.</li> </ul>	
4. Dive Team Briefing	Miscommunication, Inadequate training	3H	<ul style="list-style-type: none"> <li>- Establish a clear communication protocol and ensure all team members understand it.</li> <li>- Conduct thorough training for all team members, including emergency procedures.</li> <li>- Assign specific roles and responsibilities to each team member.</li> <li>- Use standardized hand signals and verbal commands.</li> <li>- Conduct a pre-dive briefing to ensure all team members are aware of the plan and potential hazards.</li> <li>- Establish a backup plan in case of communication failure.</li> <li>- Ensure all team members are familiar with the dive site and potential hazards.</li> <li>- Use a dive computer to monitor depth and time.</li> <li>- Establish a clear exit strategy from the dive site.</li> <li>- Conduct a post-dive debriefing to discuss any issues and lessons learned.</li> </ul>	1L
5. Explosive Placement	Unintended detonation, Poor alignment	4A	<ul style="list-style-type: none"> <li>- Conduct a thorough risk assessment before placement.</li> <li>- Use a qualified explosive expert to handle the explosives.</li> <li>- Establish a clear safety zone around the explosives.</li> <li>- Use a remote detonation system to minimize the risk of accidental detonation.</li> <li>- Ensure the explosives are properly aligned and secured.</li> <li>- Conduct a pre-detonation check to ensure everything is in place.</li> <li>- Establish a clear communication protocol for the detonation.</li> <li>- Use a backup plan in case of a failed detonation.</li> <li>- Ensure all team members are familiar with the plan and potential hazards.</li> <li>- Use a dive computer to monitor depth and time.</li> <li>- Establish a clear exit strategy from the dive site.</li> <li>- Conduct a post-dive debriefing to discuss any issues and lessons learned.</li> </ul>	2M
6. Surface Safety Zone Establishment	Unauthorized access, Collisions	3H	<ul style="list-style-type: none"> <li>- Establish a clear safety zone around the dive site.</li> <li>- Use a qualified surface safety diver to manage the zone.</li> <li>- Establish a clear communication protocol for the safety zone.</li> <li>- Use a backup plan in case of a failed safety zone.</li> <li>- Ensure all team members are familiar with the plan and potential hazards.</li> <li>- Use a dive computer to monitor depth and time.</li> <li>- Establish a clear exit strategy from the dive site.</li> <li>- Conduct a post-dive debriefing to discuss any issues and lessons learned.</li> </ul>	1L

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7. Environmental Monitoring	Pollution, Ecosystem disruption	3H		2M
8. Communication Protocols Check	Signal failure, Miscommunication	3H		1L

cess, Premature

4A

plency

3H

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12. Pre-Detonation Standby	Nervousness, Last-minute technical issues	3H		1L
13. Detonation	Faulty explosives, Communication failure	4A		2M
14. Post-Detonation Inspection	Unexploded materials, Underwater hazards	3H		1L

overlooking issues

3H



## EMERGENCY RESPONSE – CALL 000 FOR EMERGENCIES

Ensure to have an Emergency Management Plan in place as well as adequate numbers of trained first aid staff with easy access to fully stocked first aid kits, rescue equipment, material safety data sheets, adequate access to emergency communication equipment and fire-fighting equipment suitable for all classes of fire and ignition sources.

## LEGISLATIVE REFERENCES

RELEVANT LEGISLATION AND CODES OF PRACTICE. DELETE THE LEGISLATIVE REFERENCES IF ANY STATE THAT ARE NOT APPLICABLE

### Queensland & Australian Capital Territory

Work Health and Safety Act 2011

Work Health and Safety Regulations 2011

Legislation QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/work-health-and-safety-laws>

Codes of Practice QLD: <https://www.worksafe.qld.gov.au/laws-and-compliance/codes-of-practice>

Legislation ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/acts-and-regulations>

Codes of Practice ACT: <https://www.worksafe.act.gov.au/laws-and-compliance/codes-of-practice>

### New South Wales

Work Health and Safety Act 2011

Work Health and Safety Regulations 2017

Legislation NSW: <https://www.safework.nsw.gov.au/legal-obligations/legislation>

Codes of Practice NSW: <https://www.safework.nsw.gov.au/resource-library/list-codes-of-practice>

### Northern Territory

Work Health and Safety (National Uniform Legislation) Act 2011

Work Health and Safety (National Uniform Legislation) Regulations 2011

Legislation NT: <https://worksafe.nt.gov.au/laws-and-compliance/workplace-safety-laws>

Codes of Practice NT: <https://worksafe.nt.gov.au/laws-and-compliance/codes-of-practice>

### South Australia

Work Health and Safety Act 2012 (SA)

Work Health and Safety Regulations 2012 (SA)

Legislation for SA: <https://www.safework.sa.gov.au/resources/legislation>

Codes of Practice for SA: <https://www.safework.sa.gov.au/workplaces/codes-of-practice#COPs>

### Tasmania

Work Health and Safety Act 2012

Work Health and Safety (Transitional and Consequential Provisions) Act 2012

Work Health and Safety Regulations 2012

Work Health and Safety (Transitional) Regulations 2012

Legislation for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/acts-and-regulations>

Codes of Practice for TAS: <https://worksafe.tas.gov.au/topics/laws-and-compliance/codes-of-practice>

Details of permits, licenses or access required by regulatory bodies (add or delete as required):

- Permits from local council
- Authorisation to commence work
- Any required documents.

### Victoria

Occupational Health and Safety Act 2004

Occupational Health and Safety Regulations 2017

Legislation VIC: <https://www.worksafe.vic.gov.au/occupational-health-and-safety-act-and-regulations>

Codes of Practice VIC: <https://www.worksafe.vic.gov.au/compliance-codes-and-codes-practice>

### Western Australia

Work Health and Safety Act 2020

Work Health and Safety Regulations 2022

Legislation Western Australia: <https://www.commerce.wa.gov.au/worksafe/legislation>

Codes of Practice WA: <https://www.commerce.wa.gov.au/worksafe/codes-practice>

### Safe Work Australia Links

Law and Regulation (All States): <https://www.safeworkaustralia.gov.au/law-and-regulation>

Model Codes of Practice: <https://www.safeworkaustralia.gov.au/resources-publications/model-codes-of-practice>

### Model Codes of Practice

- Managing noise and preventing hearing loss at work
- Confined spaces
- Labelling of workplace hazardous chemicals
- Managing risks of hazardous chemicals in the workplace
- Welding processes
- First aid in the workplace
- Managing the risk of falls at workplaces
- Hazardous manual tasks
- Managing the risk of falls in housing construction
- Managing electrical risks in the workplace
- Demolition work
- Excavation work
- Work health and safety consultation, cooperation and coordination
- Managing the work environment and facilities
- How to manage work health and safety risks
- Managing risks of plant in the workplace
- Construction work