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Geotechnical and Water Well Drilling Operations			
Business Name:		ABN:	
Business Address:			
Contact Person:	Phone:	Email:	

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU OF 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:	

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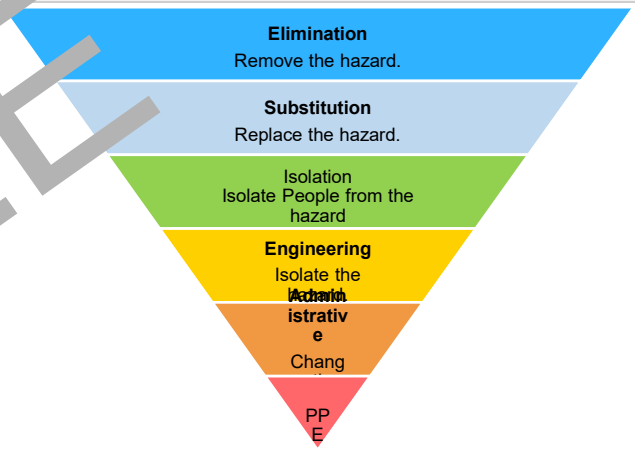
RISK MATRIX

LIKELIHOOD	INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC	SCORE	ACTION
ALMOST CERTAIN	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4 ACUTE		
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED
POSSIBLE	1 LOW	2 MODERATE	3 HIGH	4 ACUTE	4 ACUTE	3H HIGH	Rev before work
UNLIKELY	1 LOW	1 LOW	2 MODERATE	3 HIGH	4 ACU	2M MO RATE	Ensure control measures in place.
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 H	1L LOW	Monitor and keep records.

HIERARCHY OF CONTROLS



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Risk Rating & Required Action:

4A	Stop work. The risk is intolerable. E inate the hazar redesign the activity before proceeding. A Safe Work Method Statement (SWMS) or hi er-level authorisati is required.
3H	Review and approve additional c rols b ask arts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in ace and effe ive. Proceed with caution; monitor conditions.
1L	Proceed, following standard operating procedures Monitor and keep records.

Consequence Scale:

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

Notes on Hierarchy of Controls:
Remember to apply controls in the preferred order shown by the coloured pyramid:

1. **Eliminate**
2. Substitute
3. Isolate
4. Engineering
5. Administrative
6. PPE

Always document **why** a lower-order control is accepted if elimination or substitution is not reasonably practicable.

aligned with Safe Work Australia's Managing the risk of fatigue at work *(2023) and ISO 45001:2018 clauses 6–8.*

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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. Governance, WHS Duties and Legal Compliance	• Board and senior management not clearly understanding primary duty of care under WHS Act 2011 for drilling operations • Lack of documented WHS policy specific to geotechnical and water well drilling (including reverse circulation, rotary percussion, cable percussive and deep hole drilling) • Inadequate consultation processes with workers, subcontractors and health and safety representatives on drilling risks • Failure to identify and comply with applicable WHS Regulations, Codes of Practice and Australian Standards (e.g. plant, confined spaces, hazardous manual tasks, noise, vibration) • Poor integration of WHS duties into contracts, procurement and project tendering for drilling services • Inadequate due diligence by officers in monitoring WHS perfor… of drilling operations • Inconsistent appl…ation of W… requirements across … sites, states and clients	4A	• Establish a WHS management policy endorse… the Board that specifically references geotechnical, subsurface and water well drilling activities • Define and document WHS r… responsibilities a… accountabilities for officers, managers, supervisors, drillers a… offsiders … line with WHS Act 2011 • Implement a l…gal compli…ce reg…r coveri… WHS Act, WHS Regulations, relevant Codes of Practice (e.g. Managi… Risks of Pla…, Excava…n W…k, Remote Work), and relevant Australian Standards for drilling …lant a… pressur… ystems • Emb… WHS ob…ons and performance requirements into contracts with clients, subcontractors and labour …re…ovider… (including requirements for safe systems of work and reporting) • Estab…h a …mal W… consultation framework including HSRs, toolbox meetings, pre-start meetings …nd joint …anag…ment–worker safety committees for drilling operations • Im…m…t an officer due diligence program including regular WHS performance reviews, site safety …alks, a… …eview of audit findings for drilling rigs and field crews • …nduct annual external or internal audits of WHS governance and compliance for drilling operations, wit… corrective action tracking and close-out	3H
2. WHS Planning, Risk Management and Change Management	• Lack of systematic risk a…sess…nt for diverse drilling methods (e.g. angular drilling, reverse circulation, rotary boring, cable percussion, rock drilling, down-hole camera work) • Generic risk assessments not tailored to specific ground conditions, borehole depths, formation pressures or groundwater conditions • No structured management of change (MOC) when introducing new rigs, tooling, drilling fluids, or work methods • Inadequate planning for high-risk environments (e.g. unstable ground, high water table, pressurised aquifers,	4A	• Implement a formal WHS risk management procedure that requires project-specific risk assessments for all drilling campaigns, including geotechnical, environmental and water well programs • Develop and maintain a library of high-level risk assessments for each drilling technique used (rotary, rotary percussion, reverse circulation, cable percussive, rock drill, down-hole camera, borehole coating removal) that can be adapted per site • Introduce a documented management of change (MOC) process for new rigs, tooling, chemicals, drilling fluids, control systems or work methods, including HAZID/HAZOP where appropriate • Require a project WHS plan for each major drilling project, including risk register, emergency plan, traffic management, and interaction controls with other contractors and plant • Use geotechnical and hydrogeological data (where available) to inform pre-drill risk assessments for borehole stability, pressurised zones, gas, and contamination • Integrate seasonal and weather risk triggers into planning (e.g. heat management plans, wind limitations on mast raising, flood and storm contingency planning)	3H

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	contaminated sites, confined or restricted access areas) • Failure to plan interfaces with other high-risk construction activities on multi-contractor worksites • Inadequate consideration of seasonal and weather-related risks (e.g. flooding, extreme heat, storms) on borehole and deep drilling programs		• Ensure review and approval of risk assessments and MOC decisions by competent drilling supervisors and WHS advisers prior to mobilisation	
3. Contractor, Subcontractor and Labour Hire Management	• Engagement of drilling subcontractors without adequate WHS prequalification or verification of competence • Poor alignment of WHS expectations between principal contractor, drilling contractor and specialist service providers (e.g. down-hole camera, borehole sampling, coating removal crews) • Inadequate supervision of labour hire or short-term workers undertaking high-risk drilling tasks • Contractual incentives that favour production over safety (e.g. metres drilled per day without safety performance measures) • Lack of clarity over who controls the worksite and associated WHS duties where multiple parties operate (e.g. vehicle-mounted borehole rigs, earthworks contractors, survey teams) • Inconsistent induction and training requirements for subcontractor personnel operating drilling and support plant	4A	• Implement a formal contractor and labour hire WHS prequalification process including review of safety systems, licences, training records and incident history for drilling contractors • Include explicit WHS performance requirements and key performance indicators (KPIs) in drilling contracts, including incident reporting, participation in risk assessments, and adherence to site rules • Ensure written agreements clearly define PCBU relationships, who manages the worksite, and how overlapping duties will be managed for drilling operations • Require all subcontractors (including down-hole camera and sampling teams) to attend site-specific inductions and pre-start briefings prior to commencing work • Mandate minimum competency standards (national units of competency or equivalent) for drillers, offsiders and support staff engaged via subcontract or labour hire arrangements • Conduct periodic WHS audits and field verifications of subcontractor drilling crews, including supervision, adherence to procedures, and plant condition • Include right-to-stop-work clauses in contracts where there is unsafe drilling practice, and ensure commercial arrangements do not penalise safety-related delays	2M
4. Competency, Training and Licence Management	• Insufficient competency of drillers and offsiders to operate light truck-mounted and heavy duty drilling rigs safely in variable ground conditions • Lack of training in specific drilling techniques (e.g. angular drilling, rotary percussion, reverse circulation, cable percussive, deep hole drilling)	4A	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	• Inadequate training in hazard identification, isolation procedures, borehole pressure control, and emergency response • Expired or missing verification of competency (VOC), high risk work licences, and driving authorisations for mobile drill rig movements • Poor understanding of site-specific hazards such as contaminated ground, high noise, vibration and manual handling risks during borehole sampling and coating removal • No structured refresher training leading to skill fade and outdated practices		[redacted]	
5. Plant, Equipment and Engineering Control Systems	• Use of drilling rigs (truck-mounted, mobile, heavy duty, rotary boring, rock drills) that are poorly guarded or not designed to current standards • Inadequate systems for selection, procurement and acceptance testing o drilling plant and ancillary equipment (winches, hoists, rod handlers, pumps, down-hole tools) • Failure of mast, d rick or boom structure due to po inspecti overload or incorrec setup • Lack of interlocks, emergency sto or physical guarding around rotatin ill strings, rod loading syste d moving parts • Use of non-standard or incompatible components in reverse circulation or deep hole drilling systems leading to failure under pressure • Inadequate pressure relief and containment for drilling fluids and compressed air systems • Poor management of plant modifications, repairs and aftermarket add-ons (e.g. sampling equipment, camera systems, coating removal tools)	4A	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
6. Maintenance, Inspection and Pre-Use Verification Systems	• Breakdown or catastrophic failure of drilling plant due to inadequate preventive maintenance and inspection systems • Unreported defects in critical components such as drill rods, wire ropes, winches, mast pins, tyres and braking systems on vehicle-mounted rigs • No structured pre-start inspection process for drilling rigs, support vehicles, down-hole cameras and sampling tools • Maintenance work undertaken without isolation procedures, lock-out/tag-out or permit controls • Inadequate calibration and testing of safety critical devices such as pressure gauges, load indicators, gas monitors and emergency stop circuits • Limited traceability of defects, repeat failures and maintenance trends, reducing ability to identify systemic issues	4A	[redacted]	2M
7. Ground Conditions, Borehole Stability and Pressure Management	• Unexpected ground collapse or borehole instability during geotechnical and water well drilling • Inadequate planning for high-risk formations such as loose sands, swelling clays, fractured rock and voided ground • Uncontrolled water inflow, artesian pressure, or gas release from subsurface formations • Incorrect use of drilling fluids, casing, or borehole supports leading to loss of circulation or hole failure • Poor systems for assessing and managing risks of drilling near existing services, structures or slopes • Inadequate management of borehole integrity during and after sampling,	4A	[redacted]	2M

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	down-hole camera operations or coating removal		[redacted]	
8. Traffic, Mobile Plant and Journey Management	• Collisions involving vehicle-mounted drill rigs, support vehicles and other construction plant on shared worksites • Unmanaged interaction between drilling rigs and pedestrians or other trades in congested or urban environments • Inadequate journey management for remote drilling locations, including long travel distances and off-road access • Improper setup or stabilisation of mobile rigs, including outriggers, levelling and mast positioning on sloping or soft ground • Lack of traffic management planning when drilling on road reserves, verges or within live traffic corridors	4A	[redacted]	2M
9. Hazardous Substances, Drilling Fluids and Environmental Contamination	• Exposure of workers to hazardous drilling fluids, additives, cleaning agents and borehole coating removal chemicals • Uncontrolled discharge of drilling fluids, cuttings or contaminated groundwater to the environment • Inadequate identification and management of contaminated soil or groundwater encountered during subsurface drilling and sampling • Lack of systems for safe storage, labelling and transport of chemicals used in drilling, sampling and borehole maintenance • Insufficient training and information on Safety Data Sheets (SDS), correct handling and emergency response for chemical spills	3H	[redacted]	2M
10. Health Risks: Noise, Vibration, Manual Handling and Fatigue	• Chronic noise exposure from rock drills, rotary percussion and reverse circulation rigs without systematic noise controls	3H	[redacted]	2M

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	• Hand-arm and whole-body vibration from prolonged operation of drilling rigs, rock drills and support plant • High manual handling loads when handling drill rods, sampling equipment, casings and borehole coatings • Fatigue due to extended shifts, remote work, irregular hours and travel associated with drilling campaigns • Inadequate health monitoring for workers exposed to noise, vibration, silica dust or other drilling-related health hazards		[redacted]	
11. Remote and Isolated Work, Communications and Emergency Preparedness	• Delayed emergency response for remote or isolated geotechnical and water well drilling sites • Inadequate communication systems for crews working in remote areas or in deep boreholes • Lack of site-specific emergency response plans for incidents such as entrapment, borehole collapse, vehicle rollover, fire, medical emergencies or exposure to gas • No formal process for monitoring worker location, welfare and check-in/check-out for isolated drilling tasks • Insufficient emergency drills, training and equipment for likely emergency scenarios (e.g. rescue from height on drilling mast)	4A	[redacted]	2M
12. Documentation, Procedures and Information Management	• Workers operating without access to current procedures, manuals or technical instructions for drilling plant and specific drilling methods • Outdated or inconsistent Standard Operating Procedures (SOPs) across different rigs or drilling techniques • Poor version control leading to confusion about which risk	3H	[redacted]	2M

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SPECIFIC WORK STEPS	HAZARDS THAT MAY ARISE	INITIAL RISK	SPECIFIC MEASURES TO BE PUT IN PLACE TO ELIMINATE OR CONTROL THE RISKS	RESIDUAL RISK
	assessments, emergency plans and technical standards apply • Inadequate recording and retention of borehole logs, sampling records, geotechnical data and as-built information that may affect future works • Language or literacy barriers that prevent workers from understanding critical WHS and operational documents		[redacted]	
13. Incident Reporting, Investigation and Continuous Improvement	• Under-reporting of near misses, unsafe conditions and minor incidents in drilling operations • Superficial investigations that do not identify root causes or systemic issues in drilling system design and management • Failure to implement corrective actions from past incidents, audits or inspections, leading to repeat events • Limited sharing of lessons learned between drilling crews, sit[illegible]nd projects • Lack of performa[illegible]e indicators or analysis to identify [illegible]ergi[illegible] drilling-related risks	3H	[redacted]	2M
14. Client, Community and Stakeholder Interface	• Misalignment between client requirements and statuto[illegible] obligations for drilling work • Community complaints or conflict arising from noise, dust, traffic disruption, water abstraction or drilling locations • Unauthorised access by the public to drilling sites, boreholes or equipment, especially in public or semi-public areas • Insufficient coordination with landowners, utilities and other stakeholders regarding borehole placement, depths and long-term integrity	3H	[redacted]	2M

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	• Pressure from stakeholders to accelerate work or cut corners on safety to meet program or budget constraints		[redacted]	

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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 FOR 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 2025
Legislation NSW: https://www.safework.nsw.gov.au/legal-obligations/legislation
Codes of Practice NSW: https://www.safework.nsw.gov.au/resource-library/list-of-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/forms-and-resources/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

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