

Geotechnical Investigation

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

THIS RISK ASSESSMENT IS APPROVED BY THE PCBU ON THIS 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			Elimination Remove the hazard.	
LIKELY	2 MODERATE	3 HIGH	3 HIGH	4 ACUTE	4 ACUTE	4A ACUTE	DO NOT PROCEED	Substitution 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.	Engineering Isolate the hazard	
RARE	1 LOW	1 LOW	2 MODERATE	3 HIGH	3 HIGH	1L LOW	Monitor and keep records.	Administrative Change	
								PPE	

Risk Rating & Required Action:	
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.
3H	Review and approve additional controls before task starts. Senior supervisor sign-off needed.
2M	Ensure all nominated controls are in place and effective. 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.

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. WHS Governance, Legal Compliance and PCBU Duties	<ul style="list-style-type: none"> Inadequate understanding of WHS Act 2011 and WHS Regulations as they apply to geotechnical investigation activities Lack of clear allocation of PCBU, officer and worker duties across multiple parties (client, principal contractor, specialist geotechnical consultant, drilling/seismic subcontractors, laboratories) Absence of documented WHS management system (WHSMS) tailored to geotechnical and geophysical work (e.g. seismic survey operations, subsidence monitoring, hazardous ground substrate identification) Poor integration of geotechnical WHS requirements into overall project WHS plans and contracts Failure to monitor and review WHS performance of geotechnical activities at governance level Inadequate due diligence by officers in ensuring resource systems and verification processes are in place Insufficient consultation, cooperation and coordination arrangements between PCBUs on shared or overlapping duties (e.g. during site assessment, hazardous ground substrate identification on operational sites) Lack of formal process to incorporate learnings from incidents, near misses and audit findings into management system changes 	High	<ul style="list-style-type: none"> Establish and maintain a documented WHS management system aligned to WHS Act 2011, WHS Regulations, and relevant Codes of Practice with specific procedures for geotechnical investigation, seismic survey operations, subsidence monitoring and material sampling Define and document PCBU relationships (client, principal contractor, geotechnical consultant, laboratories, drilling and geophysical subcontractors) including WHS responsibilities, in contracts and service level agreements Ensure officers exercise due diligence by implementing a structured WHS governance framework including regular WHS reporting, review of geotechnical risk registers, and verification of implementation of control measures Develop a project-specific WHS management plan template for geotechnical investigations that addresses system-level management risks for formation testing, geophysical tests, porosity and filling evaluation, ground water flow testing and hazardous ground substrate identification Implement formal processes for consultation, cooperation and coordination between PCBUs, including WHS interface agreements, pre-start coordination meetings and shared emergency arrangements Establish mandatory WHS pre-qualification and ongoing performance review requirements for all geotechnical and seismic subcontractors, including verification of their WHSMS and competency systems Introduce a structured WHS risk management procedure requiring documented risk assessments (including system-level risks) prior to new or changed geotechnical investigation methods or equipment being introduced Implement periodic internal and external audits focusing specifically on geotechnical WHS governance, with corrective action tracking and management review of outcomes Maintain a WHS legal register that includes legislation, standards and guidance relevant to geotechnical investigation, and assign responsibility for keeping it current and communicating changes to affected personnel Require incident, near miss and hazard reports relating to geotechnical activities to be analysed for systemic causes, with outcomes feeding into documented management system improvements and officer due diligence reviews 	Medium
2. Project Planning, Design and Risk Management Processes	<ul style="list-style-type: none"> Inadequate early-stage risk identification for geotechnical investigation activities, leading to uncontrolled exposure to ground instability, subsidence or hazardous ground substrates Lack of integration between engineering/geological design assumptions and WHS risk 	High	<ul style="list-style-type: none"> Implement a structured project initiation and planning procedure that mandates a formal WHS risk assessment for all geotechnical investigation scopes, including formation testing, geophysical tests, ground water flow testing and hazardous ground substrate identification Require desktop reviews of existing geotechnical, mining, environmental and utilities information (including historical subsidence and groundwater data) to identify systemic risks before field mobilisation 	Medium

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	<p>assessments for formation tests, soil testing, geological surveys and seismic survey operations</p> <ul style="list-style-type: none"> • Insufficient use of existing geotechnical, subsidence, groundwater and contamination data to inform WHS planning and control selection • Failure to consider access, egress and exclusion zone requirements for drilling, material sampling and ground water flow testing in planning documentation • No formal change management process when investigation scope changes (e.g. deeper boreholes, additional features extraction tasks, different soil testing techniques) • Poor planning for concurrent operations with other contractors, creating interface risks (mobile plant interaction, noise, vibration, dust, hazardous atmosphere from subsurface conditions) • Inadequate planning for remote or isolated work, including communication and emergency response during geological survey and subsidence monitoring 		<ul style="list-style-type: none"> • Integrate geotechnical design documentation with WHS risk registers so that investigation design assumptions (depths, methods, locations) are checked against WHS constraints (ground stability, known contaminated zones, underground services, public interface) • Establish planning standards for access and exclusion zones around investigation equipment, including seismic sources, drilling rigs and material sampling equipment, and ensure these are incorporated into project-specific WHS plans • Implement a formal management of change (MOC) procedure requiring WHS review and approval when investigation scope, methods or equipment change, including assessment of systemic risks • Introduce a coordination planning process with principal contractors and adjacent operations addressing concurrent activities, vibration/noise management, and interface with critical infrastructure • Require documented work location assessments for remote or isolated geotechnical work, including communication protocols, check-in systems and specific emergency response arrangements • Ensure that planning for subsidence monitoring and ground water flow testing incorporates long-term monitoring requirements, safe access routes and maintenance of monitoring points • Mandate a pre-mobilisation planning meeting (desktop) involving project management, WHS, engineering and field supervision to confirm risk controls before site works commence • Include clear criteria in planning documents for when higher-order controls (e.g. change of method, relocation of boreholes or survey lines) must be considered due to unacceptable underlying ground conditions or system constraints 	
3. Contractor, Supplier and Laboratory Management	<ul style="list-style-type: none"> • Engagement of geotechnical, drilling seismic and laboratory contractors without adequate WHS pre-qualification or capability assessment • Inconsistent WHS standards, procedures and communication across multiple contractors performing formation tests, material sampling, soil testing on site and in laboratory environments • Lack of clarity over responsibilities for plant inspection, maintenance, calibration and safe operation of specialist equipment used in geophysical testing, seismic survey operations and ground water flow testing 	High	<ul style="list-style-type: none"> • Implement a formal contractor management procedure requiring WHS pre-qualification for all geotechnical, drilling, seismic and laboratory providers, including assessment of their WHSMS, training systems and incident history • Include explicit WHS requirements for geotechnical investigation (e.g. seismic survey safety, subsidence monitoring controls, hazardous substrate handling) in all tender and contract documentation • Define roles and responsibilities for inspection, testing, calibration and maintenance of specialist geotechnical and geophysical equipment in contracts and project WHS plans • Require contractors to submit project-specific WHS documentation (risk assessments at system level, SOPs, plant maintenance records, emergency plans) for review and approval prior to mobilisation • Establish a contractor induction and interface briefing process covering site rules, communication channels, escalation pathways and coordination arrangements for overlapping geotechnical tasks • Require laboratories to demonstrate compliance with WHS requirements for handling, storage and disposal of soil, rock and groundwater samples, including contaminated or hazardous materials 	Medium

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			[REDACTED]	
5. Site Information, Survey and Ground Condition Data Management	<ul style="list-style-type: none"> Inaccurate, incomplete or outdated site information leading to mischaracterisation of ground conditions, subsidence risk and groundwater behaviour Fragmented data management between site assessment, soil identification, geological surveys, seismic surveys, and groundwater flow testing Failure to record and communicate known or suspected hazardous ground substrates (e.g. acid sulfate soils, contaminated fill, reactive clays, voided ground) Poor integration of topographical, geological, hydrological and utilities data leading to unsafe selection of investigation locations and methods Lack of version control or traceability for changes to geological models and ground condition interpretations and subsidence predictions Insufficient data capture and retention from formation tests, soil sampling on site and in laboratories, affecting future risk assessments and design decisions 	High	[REDACTED]	Medium
6. Plant, Equipment and Technology Management	<ul style="list-style-type: none"> Use of unsuitable, poorly maintained or non-compliant plant and equipment for geotechnical investigation and seismic survey operations Inadequate systems for inspection, testing and calibration of instruments used in formation testing, groundwater flow measurement, subsidence monitoring and soil testing 	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> • Failure to manage plant interactions in constrained or complex environments, especially with other site mobile plant • Improper selection or configuration of seismic sources, drilling equipment or sampling tools resulting in excessive vibration, noise or ground disturbance • Insufficient cyber and data integrity controls for automated monitoring systems (e.g. remote subsidence sensors, groundwater loggers, geophysical data acquisition systems) • Lack of documented procedures for safe operation and lock-out of geotechnical plant and monitoring equipment 		[REDACTED]	
7. Hazard Identification, Risk Assessment and Change Management	<ul style="list-style-type: none"> • Inconsistent or superficial hazard identification for complex ground and subsurface conditions across different projects and teams • Reliance on generic risk assessments that do not consider project specific geotechnical factors such as subsidence potential, groundwater pressures and hazardous substrates • Failure to recognise and act on emerging risks during investigations when actual conditions differ from those anticipated (e.g. unexpected voids, artesian pressures, contaminated materials) • Lack of structured change management when investigation methods, sequences or locations are altered during delivery 	High	[REDACTED]	Medium

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	<ul style="list-style-type: none"> Inadequate involvement of competent geotechnical and WHS professionals in risk assessment processes Poor documentation and communication of risk control decisions and rationales to operational personnel 		[REDACTED]	
8. Environmental and Groundwater Interaction Risk Management	<ul style="list-style-type: none"> Uncontrolled changes to groundwater flow or quality during ground water flow testing and drilling, resulting in environmental harm and secondary WHS risks Inadequate control of contaminated or hazardous groundwater and soil, including during sampling and pumping activities Poorly planned disposal or disposal of test water, drilling fluids and cuttings leading to erosion, contamination or unsafe ground conditions Failure to consider interactions between geotechnical investigations and existing contaminated land management systems Insufficient monitoring of groundwater levels and pressures affecting ground stability, subsidence and infrastructure performance Lack of integration between environmental approvals/conditions and WHS controls for geotechnical investigation works 	High	[REDACTED]	Medium

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9. Communication, Consultation and Information Sharing	<ul style="list-style-type: none"> Inadequate communication of geotechnical hazards, controls and changes between project stakeholders, including other PCBUs sharing the site Limited worker consultation in planning and reviewing geotechnical investigation methods and controls, leading to unreported issues and low ownership Failure to communicate key findings from site assessments, soil identification, seismic surveys and subsidence monitoring to those who need to act on them Language, literacy or cultural barriers affecting understanding of WHS expectations and ground-related risks Poor escalation pathways for emerging risks identified during formation tests, groundwater testing or hazardous substrate identification 	Medium	<p>[REDACTED]</p>	Low
10. Emergency Preparedness, Incident Management and Business Continuity	<ul style="list-style-type: none"> Lack of emergency plans specific to geotechnical incidents such as ground collapse, sudden subsidence, inundation from groundwater, exposure to hazardous substrates or gas release from strata Insufficient coordination of emergency arrangements between PCBUs conducting concurrent geotechnical and construction activities Delayed or ineffective response due to unclear roles, inadequate equipment or poor communication during a geotechnical emergency Under-reporting or poor investigation of geotechnical near misses leading to 	High	<p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p> <p>[REDACTED]</p>	Medium

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	<p>missed opportunities to address systemic issues</p> <ul style="list-style-type: none"> Inadequate business continuity planning for critical monitoring programs (e.g. subsidence monitoring, groundwater tracking) in the event of system failures or site access restrictions 		[REDACTED]	
11. Monitoring, Review, Audit and Continuous Improvement	<ul style="list-style-type: none"> Failure to systematically monitor the effectiveness of WHS controls for geotechnical investigation activities over the project lifecycle Limited verification that procedures for soil testing, geophysical surveys, groundwater monitoring and subsidence tracking are being followed in practice Inadequate performance indicators for geotechnical WHS risks, leading to blind spots for management Lack of structured review of monitoring data (e.g. subsidence trends, groundwater variations, near misses) to identify emerging systemic issues Audit processes that exclude or give limited coverage to geotechnical-specific WHS controls and management systems 	Medium	[REDACTED]	Low

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			<div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px; margin-bottom: 5px;"></div> <div style="background-color: black; width: 100%; height: 15px;"></div>	

SAMPLE

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>

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>

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-codes-of-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>

Northern Territory

Work Health and Safety (National Uniform Legislation) Act 2011
 Work Health and Safety (National Uniform Legislation) Regulation 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>

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>

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>

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

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.