

12 SEPTEMBER 2024 / VERSION 1

# Summary of audits and inspections

## QGN32: Managing Exposure to Heat in Surface Coal Mines and Surface Areas of Underground Coal Mines



Resources  
Safety & Health  
Queensland

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## 1.0 Quick reference summary of audits & inspections



25 site visits



45% of all open cut coal mines



Every coal company had at least one site audited or inspected

0

Directives

17

SCP

28

Opportunities for improvement

Audits and inspections focused on managing heat exposure (QGN 32) were conducted by Resources Safety and Health Occupational Hygiene Inspectors (Coal) between 2023-2024.

## 2.0 Context

In January 2022, [Guidance Note QGN32: Managing Exposure to Heat in Surface Coal Mines and Surface Areas of Underground Coal Mines](#) (QGN32) (1) was released for adoption by the Queensland coal mining industry. This guidance note was developed through a tripartite process involving representation from the coal mines safety regulator, coal company operators, and coal mine workers (CMWs), as well as subject matter experts.

## 3.0 Key points about Guidance Notes

Guidance Notes provide practical guidance to assist Mine Operators and Site Senior Executives with meeting their legislative obligations in relation to applying risk management to specific hazards at the mine. The contents of these documents include information about the hazard and provide options for consideration when applying the risk management processes in practice, to achieve an acceptable level of risk, under the Coal Mining Safety and Health Act 1999 (CMSHA) (2).

The guidance should be considered in addition to Recognised Standards and any Australian or International Standards, that may be applicable to the specific hazard and risk management more generally.

It is the Coal Inspectorate's expectation that following the release of a guidance note, mine sites will:

- undertake a gap analysis of the guidance note against the mine's safety health management system (SHMS) within six months of release.
- identify any shortfalls and/or opportunities for improvement.
- prepare an action plan, with completion dates, to address the gaps.
- assign actions to persons with the authority and accountability to address the actions at the mine; and
- execute the action plan within a reasonable time frame.

## 4.0 Introduction

QGN32 provides a framework for mines to manage heat exposure on site. This covers aspects of heat exposure on open cut coal mines and the surface areas of underground coal mines. The primary objective of the QGN was to assist coal mines shift focus toward managing heat exposure in the prevention of heat related illness. The guidance note outlines that heat exposure should be managed in a structured and systematic approach considering the impacts of:

- environmental conditions
- physically demanding work
- process generated heat
- clothing and Personal Protective Equipment (PPE)
- health and individual factors.

Deliberate and systematic management of heat exposure is required to minimise the risk of over-exposure leading to adverse health and safety incidents. Historically there has been an apparent under reporting of heat related incidents from surface mines in Queensland and this is likely due to a lack of understanding and consideration of the role of heat exposure as a contributing factor, to a range of different high potential incidents (HPIs) which are reported. In addition, anecdotal information indicates that heat related incidents are often attributed to and classified according to non-work-related predisposing factors identified with the individual, rather than to heat exposure, where the later may not be the primary factor. For example, if the incident would not have occurred, except for the presence of heat conditions at the time, then the incident should be considered heat related, regardless of an individual's pre-disposing condition.

## 5.0 Overview of Inspection / Audit Program

In 2023, an audit/ inspection regime was initiated by Resource Safety and Health Queensland (RSHQ) Occupational Hygiene Inspectors (Coal). This process concluded in April 2024 after completion of 25 inspections and audits representing approximately 45% of surface coal mines. In addition, a number of undergrounds were audited to understand heat management on surface parts of these mines. Most companies had at least one mine from each of the coal operating companies receive an inspection or audit.

The audit / inspections were conducted with tools mapped against QGN32. These consisted of both a desktop and field component. For larger operations, these activities were split across separate days.

Emphasis was placed on the following elements of heat exposure management and control:

- Identifying areas, tasks and similar exposure groups where CMWs may be exposed to high heat conditions and / or performing physically demanding work.
- Considering work process factors such as proximity to heat source, work processes generating heat (welding), intensity of work, and PPE required to be worn.
- Incorporating individual and pre-disposing factors into risk assessment of tasks, such as medications, acclimatisation, fatigue, age, physical fitness etc.
- Appropriately assessing the thermal environment such as (i) using local weather monitoring and forecasting of ambient conditions (eg.national Bureau of Meteorology (BOM)); and supplementing this with the use of portable monitoring devices to accurately assess the thermal conditions at particular positions (e.g. in the pit on coal with limited cross breezes).
- Ensuring trigger action response plans (TARPs) had been developed, implemented and / or reviewed to address all the items listed in section 6.4 QGN32.
- Training of coal mine workers on heat identification, control and emergency response.
- Appropriately incorporating heat in the reporting of incidents, specifically heat related incidents as well as a potential contributing factor in all incidents.

## 6.0 Key Findings

In general, the application of QGN32 was found to be inconsistent across the mines reviewed. It was found that most procedures were focused on maintaining hydration and managing CMWs with heat stress symptoms. Very few mines had undertaken a gap analysis against QGN32 and had shifted the focus toward managing heat exposure and the prevention of heat related illness.

Several issues were consistently identified during this program. These are listed below. Some of the more significant items are discussed in detail later in this document.

- Risk Management process applied to the management of heat was inadequate and / or did not meet the process outlined in section 5.0 QGN32.
- The site did not have a SHMS that included the effective management and control of heat exposure. Section 62(f) of the CMSHA (2) and specifically, Section 143 of CMSHR (3) requires 'A surface mine's safety and health management system must include a procedure for protecting persons from heat that may lead to heat stress, heat exhaustion or heat stroke', and section 10.0 QGN32 provides guidance for developing an SHMS that includes effective management and control of heat exposure.
- The site had not considered and were not applying a heat TARP process, as outlined in section 6.4 QGN 32, as a practical method for managing escalating heat exposure conditions. This can occur between and within each shift, for example due to the result of changing weather conditions.
- A list of medications that may affect heat intolerance in individuals had not been reviewed as per the requirements of a health surveillance program outlined in section 6.5 QGN32.
- Inadequate systems in place for the identification and reporting of heat related incidents as per section 4.0 QGN32.
- Training of CMWs did not meet the requirements outlined in section 9.0 QGN32, for conducting education and awareness on heat exposure and the application of heat TARPs at the mine.
- Emergency response processes for heat related illness needed updating and did not consider current best practices as outlined in section 7 QGN32.

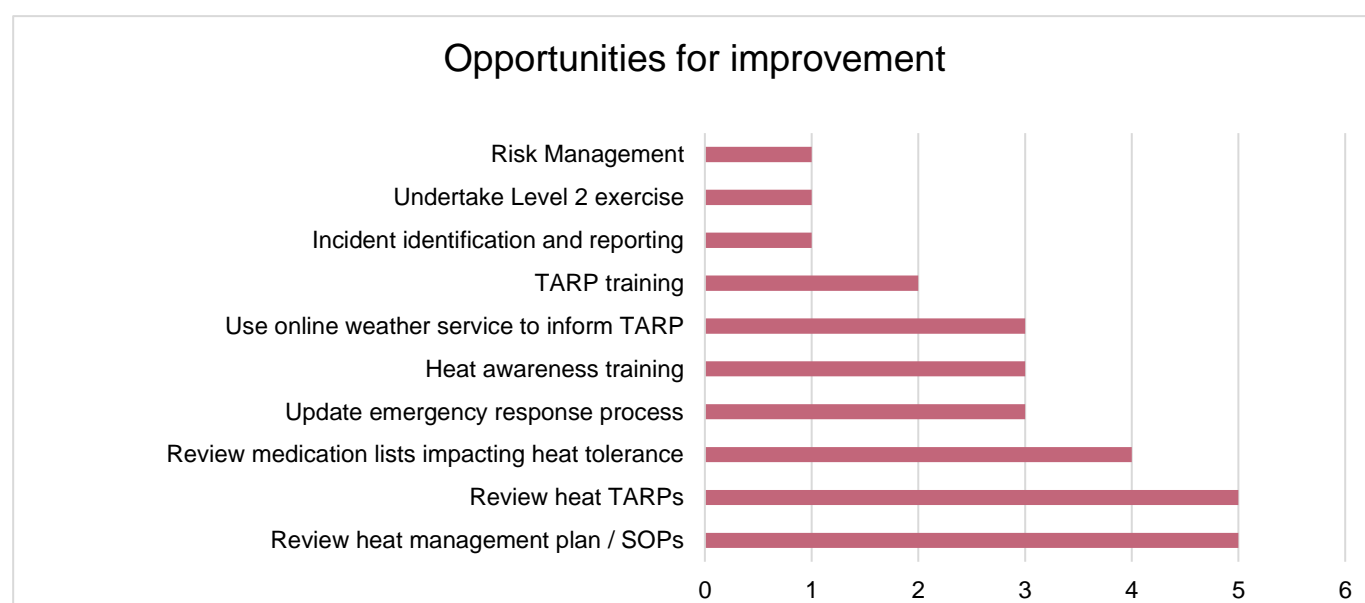


## 7.0 Corrective actions issued to sites

As a result of this program there was a total of 17 corrective actions issued across the 25 sites. Every site received at least one corrective action or recommendation / opportunity for improvement. These corrective actions are broken down as follows.

- **Directives – 0**
- **Substandard condition or practice (SCPs) – 17**

The 17 SCPs all related to the need to review and update procedures to align with QGN32. There were 28 recommendations or opportunities for improvement and they are detailed in their respective category in Figure 1. The review of TARPs (including weather services used to inform TARPs), SOPs, and medication lists, represented 60% of opportunities for improvement.



**Figure 1:** Number of recommendations / opportunities for improvement issued by category

## 8.0 Important discussion points

The following elements were consistently identified, as an improvement opportunity and are discussed in more detail below.

### Shift focus to prevention of heat related illness

The majority of sites' SHMS documentation focused on maintaining personal hydration levels and the treatment of CMWs after becoming aware they are affected by heat illness. These are important factors in the overall heat management strategy, but greater emphasis needs to be directed at prevention of CMWs from developing heat related illness. This can be achieved by managing heat exposure more effectively, including:

- modifying the work environment (working under shade, cooling fans, removing or shielding heat sources, removing water bodies).
- modifying the task (manual aids to reduce physical activity, work rest regime, planning work for cooler times of the day).
- modifying work clothing or PPE to allow for better heat exchange.
- responding to changing environmental conditions (TARPs linked to weather monitoring data).
- education of workers to understand signs and symptoms of heat illness and individual factors that may increase risk.

### Establishing risk profile for work groups

Inspections revealed that consideration for the different risk profile of various work groups or SEGs was not often undertaken. The emphasis was generally placed only on environmental parameters and not on other individual or task related factors. It is important to understand the risk profile of each work group or SEG and factor this into the TARP process.

Not all CMWs are at risk of developing heat related illness, however some groups may be at significant risk. This may be because of the environment in which they operate, the type of work they are required to perform, the clothing or equipment they wear or the individual factors.

### Review TARPs (including weather services to inform TARPs) and SOPs

The inspection and audits identified that very few sites had developed and implemented TARPs that assisted sites respond to escalating environmental or task specific conditions that increased heat illness risk of CMWs.

The integration of simple TARPs into SOPs for daily work schedules allow sites to proactively prepare for impending conditions and provide simple triggers to allow sites to respond when risk increases through the course of a shift.

TARPs should consider those factors detailed in QGN 32 including but not limited to the following:

- Environmental weather data representative of the work location.
- Working in shade or direct sunlight.
- Physical work rate intensity (low, moderate, high).
- The work /rest regime.
- Access to water and air-conditioned facilities for cooling.
- The type of clothing, PPE and other equipment worn by the person.

In addition, individual factors of the CMW need to be considered (e.g. acclimatisation, physical fitness and medications).

## Health Surveillance

It is imperative that sites review their health and medical surveillance programs to ensure that if a CMW is potentially exposed to hot/humid conditions, the employer has identified this under section 1 of the approved Health Assessment Form as required by section 46A of the CSMHR (3). Health surveillance programs should include as a minimum:

- an assessment of the individual's tolerance to work in heat;
- predisposing medical conditions;
- use of medications; and
- history of heat exposure and heat related illness.

## Review medications list that may be impacted by heat exposure

Inspection revealed that very few sites were aware of or had considered the impacts of medications that may increase the risk of CMWs when working in heat. There is an extensive list of medications with implications resulting in the intolerance to heat listed in QGN32 Appendix 1.

This list should be integrated into the mines medical declaration process and consulted when CMWs declare medications. It is highly likely that CMWs will not always be aware of these implications.

## Training of CMW on heat (including TARPs training)

The training requirements for CMWs are detailed in section 9 QGN32 . This training should be conducted yearly prior to the summer season or when TARPs trigger the need for additional awareness, for example during heat wave events. Approximately 25% of coal mines visited did not meet the education and training requirements of QGN32. In addition to the shortcomings identified with content material, the training was often not formalised and recorded, or part of the mines structured training scheme.

Where training was provided it often only focused on aspects of hydration and treating a person after showing signs of heat illness. It did not address specific risk management processes applied at the mine prior to working in a hot / humid environment, nor the impact of heat exposure on work performance, nor general well-being for everyday life outside of work, nor cultural attitudes towards heat exposure which underplay the potential risk to

CMWs. Training should also clearly outline the individual and personal factors that may increase the heat exposure risk such as acclimatisation, medications, physical fitness, alcohol consumption and dietary consideration.

## 9.0 Recommendations for site senior executives

The following recommendations are made to site senior executives (SSEs) for consideration and review. Inspectors will be on site to discuss, review, and action these recommendations, as required.

1. Ensure the site has undertaken a gap analysis against QGN32 and has an action plan in place to manage heat exposure on site.
2. Consider application of exposure controls that may be implemented to assist in the prevention of heat illness including:
  - Portable shade available to work under.
  - Access to air-conditioned crib facilities or cooling rooms.
  - Portable fans and air coolers
  - Access to cool water, ice and ice blocks /slushies for drinking.
  - Work / rest regimes.
  - Work clothing that promotes cooling.
3. Identify and focus controls on workers at higher risk of heat exposure, including:
  - CMWs who are required to work outdoors for prolonged duration during summer, with limited access to shade and/or ventilation.
  - CMWs who are required to wear additional equipment, coveralls or PPE, that prevents heat exchange and natural cooling.
  - CMWs who are required to do physical work at a higher metabolic rate or are required to work around heat generating sources and in humid conditions (e.g. around water).
4. Use online weather services appropriately and in conjunction with tools (portable monitoring devices and/or localised weather stations) to inform Heat TARPs.
5. Ensure CMWs are trained in the use of TARPs and consider heat in their routine risk assessments of tasks.
6. Review processes for the training of CMWs so that the matters specified in QGN32 are included in induction and refresher training. Refresher training scheduled to coincide with start of the hot summer season.
7. Review incident investigation processes to ensure as a minimum the items specified in section 8 of QGN32 are included and addressed and the failed or absence of controls specified in Appendix 5 of QGN32 are considered.
8. Review the SHMS documentation and provisions relating to heat management to ensure continued suitability, adequacy and effectiveness as specified in QGN32. This should include the following:
  - Periodic review of SOPs and TARPs with particular focus leading into summer months and heat wave events. Ensure those with the authority and accountability for the actions are involved and tasks appropriately assigned.
  - Consider reviewing the number of TARP activations and heat related incidents recorded during previous summer seasons, as a measure to verify control effectiveness of the TARP trigger levels and response, and overall effectiveness of the SOP.
  - Review medical declaration process to include medications listed in QGN32, that may have implications for heat intolerance.

- Updating heat incident identification and reporting process and give consideration of and Inclusion of heat as a potential contributing factor in HPIs and serious accidents, where appropriate.
9. Review emergency response processes for heat related illness to ensure the latest advice is applied in practice.
- Consider conducting a Level 2 exercise involving recovery, response and treatment of CMW in heat stroke condition.
  - Consider items required for the rapid cooling of a person and how these could be deployed by the emergency response team (ERT) or how portable emergency heat treatment kits could be made available at remote work sites (eg. exploration drilling site), to be used by first responders during the critical first 30 minutes, while waiting for the ERT to arrive.

## 10.0 Bibliography

1. **RSHQ.** *Guidance Note QGN32: Managing Exposure to Heat in Surface Coal Mines and Surface Areas of Underground Coal Mines.*  
[https://www.rshq.qld.gov.au/\\_\\_data/assets/pdf\\_file/0003/1594812/QGN32-Managing-Heat-Exposure-in-Surface-Coal-Mines-and-Surface-Areas-of-Underground-Coal-Mines.pdf](https://www.rshq.qld.gov.au/__data/assets/pdf_file/0003/1594812/QGN32-Managing-Heat-Exposure-in-Surface-Coal-Mines-and-Surface-Areas-of-Underground-Coal-Mines.pdf) : Resources Safety and Health Queensland, 2022.
2. **State of Queensland.** *Coal Mining Safety and Health Act 1999.* Queensland : Office of the Parliamentary Counsel, 2022.
3. Coal Mining Safety and Health Regulation 2017. Queensland : Office of the Parliamentary Counsel, 2022.
4. **Brearley, Dr. Matt.** Heat Stroke Treatment in the Field . *Thermal Performance* . [Online] Thermal Performance , 28 August 2024 . [Cited: 28 August 2024.]  
<https://www.thermalhyperperformance.com.au/heat-stroke-treatment-in-the-field>.

## 11.0 Abbreviations

CMSHA	<i>Coal Mining Safety and Health Act 1999</i>
CMSHR	Coal Mining Safety and Health Regulation 2017
CMW	Coal Mine Workers
ERT	Emergency Response Time
HPI	High Potential Incidents
PPE	Personal Protective Equipment
RSHQ	Resource Safety and Health Queensland
SEG	Similar Exposure Group
SHMS	Safety Health Management System
SSE	Site Senior Executives
TARP	Trigger Action Response Plan



# Appendix A: An example of a TARP for heat

TARP Level	Normal status	Level 1 response			Level 2 response			Level 3 response		
Environmental trigger conditions	Apparent Temperature Heat Index = <34	Apparent Temperature Heat Index = 35 to 45			Apparent Temperature Heat Index = 46 to 53 OR Heat Wave forecast			Apparent Temperature Heat Index = >54		
Work rate	Un-restricted self-paced work - low risk	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Work / rest ratio		Consult with supervisor	50/10 or job rotation	40/20 or job rotation	Consult with supervisor	40/20 or job rotation	30/30 or job rotation	Consult with supervisor		
		Rest breaks to be taken in cool area (airconditioned vehicle cabin/ crib room, or shade area with good ventilation)								
ROLE	Response required									
OCE	<ul style="list-style-type: none"><li>Monitor Weatherzone/ BOM forecast</li><li>Update OCE report with TARP Level response for shift recorded.</li></ul>	<ul style="list-style-type: none"><li>As per Normal state</li><li>Communicate change in TARP level to Supervisors &amp; ERT</li></ul>			<ul style="list-style-type: none"><li>As per Level 1</li><li>Notify Superintendent/ Manager of changes to TARP level</li></ul>			<ul style="list-style-type: none"><li>As per Level 1 &amp; 2</li><li>Reschedule works</li></ul>		
Appointed Supervisor/s	<ul style="list-style-type: none"><li>Review OCE report and heat risk outlook for shift</li><li>Ensure general heat stress controls available incl. shade, fans, mechanical aids</li><li>Confirm heat awareness training for CMWs is completed &amp; current</li><li>Ensure access to adequate cool drinking water &amp; ice</li></ul>	<ul style="list-style-type: none"><li>As per Normal state</li><li>Identify heat-risk workers and tasks</li><li>Assess work rate and plan tasks to apply Level 1 work/rest regime</li><li>Discuss heat stress management at pre-start</li><li>Ensure all team members aware of TARP level and required controls.</li><li>Ensure un-acclimatised persons are not scheduled to work alone without appropriate risk assessment and controls implemented</li><li>Implement heat controls to reduce heat exposure ie. shade, fans, task relocation, mechanical use to limit physical labour</li></ul> <u>Heat-risk workers &amp; tasks:</u> <ul style="list-style-type: none"><li>Implement ‘Symptoms self-assessment questionnaire’</li><li>If ERT are more than 30 mins from workers ensure emergency response</li></ul>			<ul style="list-style-type: none"><li>As per Level 1</li><li>Notify Superintendent/Manager of changes to TARP level</li><li>Identify heat-risk workers and tasks</li><li>Implement Level 2 work/rest regime</li></ul> <u>Heat-risk workers &amp; tasks:</u> <ul style="list-style-type: none"><li>Consider implementation of higher level controls ie. Postpone high risk tasks to cooler time of day or night</li></ul>			<ul style="list-style-type: none"><li>As per Level 1 &amp; 2</li><li>Identify heat risk tasks, review risk assessment and adequacy of heat controls</li><li>Reschedule heat-risk workers &amp; tasks</li></ul>		

		equipment is available at location of workers – wet (iced) / towels etc		
All CMWs Heat-risk workers include: Boilermakers/ hot works, blast crew, blast hole drillers, field maintenance, exploration drillers, industrial cleaners, surveyors, environmental personnel	<ul style="list-style-type: none"> <li>Ensure you have adequate cool drinking water available and drink regularly</li> <li>Consider time of day and weather and be prepared to escalate to Level 1</li> <li>Ensure access to shade or an airconditioned environment as needed</li> </ul>	<ul style="list-style-type: none"> <li>As per Normal state</li> <li>Notify Supervisor if un-acclimatised</li> <li>Follow Level 1 work/rest regime and hydration rate in consultation with Supervisor</li> <li>Use available heat controls ie shade, fans, task relocation, mechanical aids</li> <li>If heat controls inadequate or ineffective, stop work and notify Supervisor/ OCE for review</li> <li>Report any signs of heat stress to the Supervisor and others in work group</li> </ul> <p><u>Heat-risk workers &amp; tasks:</u></p> <ul style="list-style-type: none"> <li>Complete 'Symptom Self-Assessment Questionnaire'</li> </ul>	<ul style="list-style-type: none"> <li>As per Level 1</li> <li>Follow Level 2 Work / rest regime and take rest breaks in cool environment.</li> <li>Implement additional heat controls in consultation with Supervisor</li> </ul>	<ul style="list-style-type: none"> <li>As per Level 1 &amp; 2</li> <li>No heat-risk work to be undertaken until a risk assessment is completed for the task in consultation with your supervisor or team leader.</li> </ul>
Un-acclimatised workers	<ul style="list-style-type: none"> <li>As above</li> </ul>	<ul style="list-style-type: none"> <li>As above</li> <li>No working alone</li> </ul>	<ul style="list-style-type: none"> <li>As above</li> <li>No high work rate to be undertaken</li> <li>No working alone</li> </ul>	<ul style="list-style-type: none"> <li>As above</li> <li>No work to be undertaken until a risk assessment is completed for the task in consultation with your supervisor or team leader.</li> </ul>

Work rate	Example
Low	Standing / spotting while maintaining plant or equipment, using electric tools, walking on flat surfaces, operating equipment, basic fitting, administration eg. OCE observing.
Moderate	Sustained hand and arm work (hammering, pneumatic tools), climbing up and down stairs, intermittent handling of heavy material, pushing or pulling loads eg. Servicing equipment, tyre fitting
High	Intense arm/ trunk work (using hand tools for long periods), carrying heavy material, shovelling, carrying loads upstairs, pushing or pulling heavy loads

# Appendix B: Apparent Temperature Heat Index

		Relative Humidity												
		40	45	50	55	60	65	70	75	80	85	90	95	100
Temperature C	23	24	25	25	26	27	28	28	29	30	31	32	32	33
	24	25	26	27	28	28	29	30	31	32	33	33	34	35
	25	27	27	28	29	30	31	32	33	34	34	35	36	37
	26	28	29	30	31	32	33	34	34	35	36	37	38	39
	27	29	30	31	32	33	34	35	36	37	38	39	40	41
	28	31	32	33	34	35	36	37	38	39	40	41	42	43
	29	32	33	35	36	37	38	39	40	41	42	43	45	46
	30	34	35	36	37	39	40	41	42	43	45	46	47	48
	31	35	37	38	39	40	42	43	44	45	47	48	49	50
	32	37	38	40	41	42	44	45	46	48	49	50	52	53
	33	39	40	41	43	44	46	47	48	50	51	53	54	55
	34	40	42	43	45	46	48	49	51	52	54	55	57	58
	35	42	44	45	47	48	50	51	53	54	56	58	59	61
	36	44	45	47	49	50	52	54	55	57	59	60	62	63
	37	45	47	49	51	52	54	56	58	59	61	63	65	66
	38	47	49	51	53	55	56	58	60	62	64	66	67	68
	39	49	51	53	55	57	59	61	63	65	66	68	70	72
	40	51	53	55	57	59	61	63	65	67	69	71	73	75
	41	53	55	57	59	61	64	66	68	70	72	74	76	79
	42	55	57	59	62	64	66	68	71	73	75	77	80	82

## Appendix C: Example of Heat-risk workers

Factors	Work Group	Example of role, task & PPE
Outdoor work in the sun	Blast crew	Dipping, loading, firing
	Pump crew	Working in and around water
	Field maintenance	Down day, service crew
	Groundskeeping	Yard maintenance, manual handling, repair work
	Workshop	Boilermakers, maintenance activities
	CHPP maintenance	Conveyor works, maintenance activities
	Exploration	Drillers and cultural heritage
	Tech services	Environmental monitoring
Work process generated heat	Workshop	Boilermakers, maintenance activities
	CHPP Laboratory	Sample ovens
Physically demanding work	CHPP operators	Ascending / descending stairs, unblocking chutes
	Field maintenance	Down day, service crew
	Groundskeeping	Yard maintenance, manual handling, repair work
	Workshop	Boilermakers, maintenance activities
	Civil construction	Traffic controller, manual handling equipment and tools, concreting
Confined spaces	Field maintenance	Dragline / planned maintenance
	CHPP maintenance	Confined space with little ventilation
	Workshop	Working in mobile equipment or control room cabins with little ventilation
Protective clothing	Maintenance / Groundskeeping / CHPP	Aprons, gloves, face shields Disposable coveralls Breathing apparatus

## Appendix D: Examples of good controls for heat exposure



**Figure A1:** Portable shade for exploration driller



**Figure A2:** Portable shade and a fan for a boilermaker in the field



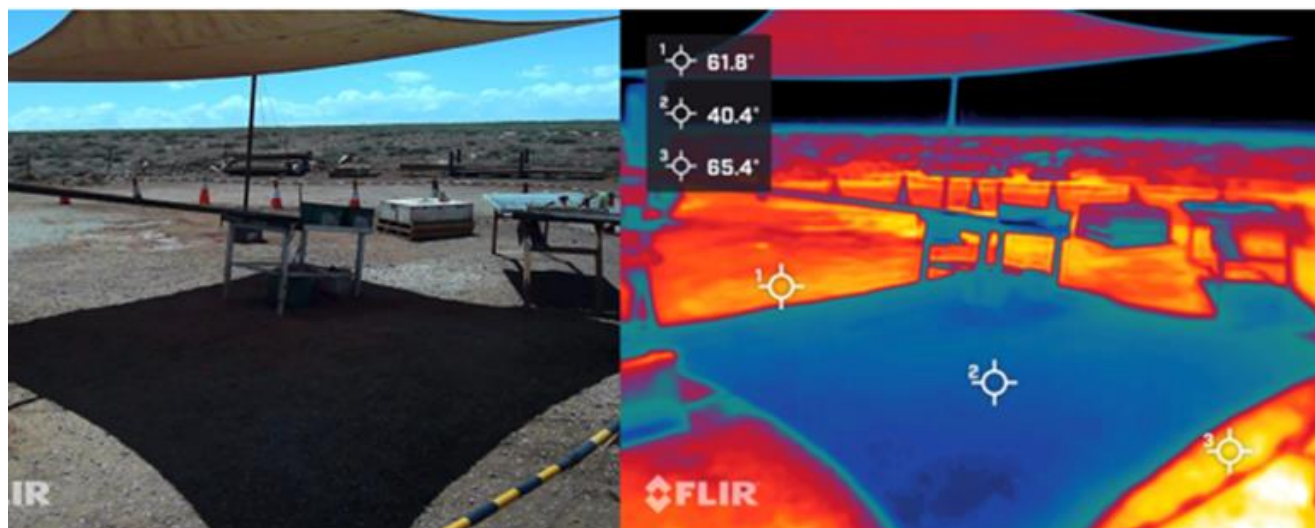


**Figure A3:** Shade outside a crib room



**Figure A4 & A5:** Portable air-conditioned fan units provide cool air inside workshops

## Appendix E: An example of the variation in temperature with shade



**Figure A6:** Impacts of shade cloth

## Appendix F: An example of a portable heat stroke kit for use in the field at remote sites ( $\geq 30$ min ERT response time)



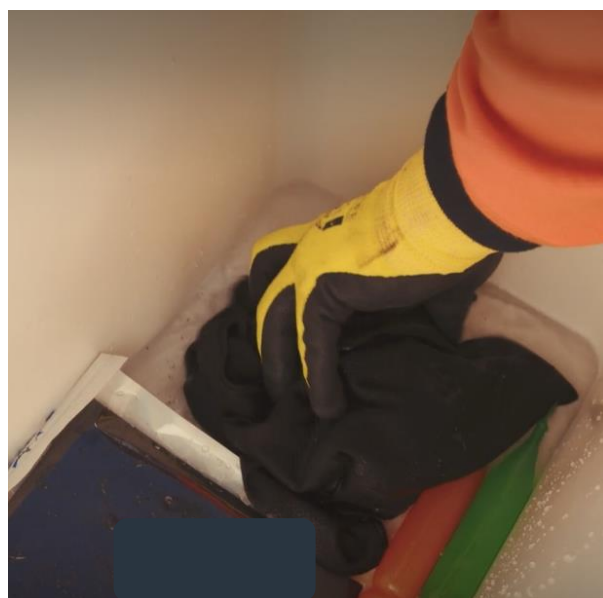
**Figure A7:** Portable esky kit (Ice, water, towels) (4)



**Figure A8:** Instructions under lid (4)



**Figure A9:** Kit contained inside portable esky (4)



**Figure A10:** Ice cooled towels ready to be applied (4)