

Targeted intervention program

Lead exposure management at metalliferous mines

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Executive summary

In response to significant concerns regarding the implementation and effectiveness of controls associated with lead management, the Chief Inspector of Mines initiated a targeted intervention at mining operations across the state, focusing on the management of lead hazards.

Eight metalliferous mine sites across NSW were identified for assessment, which were conducted by a team of 4 inspectors over 6 days during March and April 2023.

This report summarises the assessment results, the issues raised and commentary on those issues.

Inspectors issued 12 work health and safety notices in relation to managing lead hazards and legislative compliance. This included 8 Section 23 notices of concern and 4 Section 191 improvement notices.

The assessments focussed on identifying and managing work practices that contain a lead risk, examining both documentation and implementation of controls. While overall results identified an appropriate level of risk-based management of lead work practices, there were several areas identified for improvement at the majority of mines assessed.

The common issues included inadequate documentation in relation to the requirements of the Work Health and Safety Regulations 2017, the consumption of food/drinks where lead or lead compounds were present, and washing facilities not being available, used, maintained, or positioned appropriately.

Inadequate sign standards around hygiene requirements for using/handling lead and lead compounds were also observed, in addition to a lack of procedures and processes for decontaminating equipment before leaving site.

Further details of the assessment findings are provided later in this report. Mine operators are encouraged to review these findings and consider how they may apply to their operations.

1. Introduction

The NSW Resources Regulator published its Incident Prevention Strategy in February 2016.

A key component of the strategy is the introduction and implementation of a risk-based intervention framework. The framework identifies and confirms risk profiles, verifies risk control measures and allocates resources based on risk priority.

The implementation of the strategy included the development of two operational approaches to regulatory activity. These are:

- targeted assessment programs (TAP): a planned, proactive program that assesses the overall effectiveness of an operator's attempt to control critical risk
- targeted interventions: a response to a specific incident, series of incidents or other intelligence, which assesses how effectively relevant risks are being controlled (see below for further detail).

2. Background

Targeted interventions provide a systematic response to a critical risk. They can be applied across all sectors of the mining industry. The need to undertake an intervention will be identified through:

- a series of events
- a single significant event, such as a catastrophic failure or fatality
- a change in the operation's risk profile
- data that suggests an emerging issue.

Targeted interventions are typically undertaken by a team of inspectors. The interventions provide an assessment of the:

- operational and management plans and supporting documentation
- implementation of plans and procedures
- effectiveness of control measures
- operator's compliance with relevant legislative provisions.

Scope

The scope of the assessments includes 2 elements:

- a desktop assessment of:
 - compliance against legislation with respect to the management of risks to health and safety associated with lead exposure risks at the site
 - controls the mine utilises to prevent and mitigate the risks to health and safety associated with lead exposure
 - the systems the mine utilises to monitor the effectiveness of those controls.
- a workplace assessment of the implementation of those controls.

Assessment findings

The assessment findings below relate to both documentation and in-field observations. The information provided should be used to inform and improve a mining operation's safety management system in relation to the risk of lead in the workplace.

Health control plans and lead management plans

Issue	Response
<p>At some sites, it was noted that lead management plans and overarching health control plans were lacking in matters to be addressed as prescribed in the WHS Regulation. In particular, the requirement for the review of control measures for lead exposure, the requirement for health monitoring of workers commencing lead risk work, the frequency of biological monitoring and the current legislated blood lead concentrations for lead risk work and the removal of workers from lead risk work.</p>	<p>Part 7.2 of the WHS Regulation 2017 describes the requirements for the management of risk at workplaces where lead processes are carried out. Legislation requires any measures implemented to control health risks from exposure to lead to be reviewed and revised under specific circumstances¹. Mine operators also have an obligation to provide health monitoring for workers (including contractors) before commencing lead risk work², and at prescribed frequencies whilst conducting lead risk work³. Mine operators should ensure management plans and health control plans reference the current legislated blood lead concentrations for lead risk work⁴ and removal of workers from lead risk work⁵.</p>
<p>Lead management plans and health control plans at some sites were found to reference the incorrect regulatory body in relation to notifications of lead risk work and duty to supply health monitoring reports.</p>	<p>Mine operators are required to provide notice to the Regulator when it is determined that work conducted at the site is lead risk work, or when the information provided in a lead risk work notification change⁶. The Regulator must also be notified when a worker is removed from lead risk work⁷ and mine operators have a duty to provide the health monitoring report to the Regulator⁸. In these instances, the Regulator is the regulatory body to which notifications and health reports should be provided.</p>
<p>At some sites, a copy of the lead risk work notification document was not readily accessible to workers or health and safety representatives.</p>	<p>Mine operators are required to keep a copy of the lead risk work notification submitted to the Regulator. This document should also be readily accessible to workers who are likely to be exposed to lead and the worker's health and safety representatives⁹.</p>

¹ Work Health and Safety Regulation 2017 Clause 401 Review of control measures

² Work Health and Safety Regulation 2017 Clause 405 Duty to provided health monitoring before first commencing lead risk work

³ Work Health and Safety Regulation 2017 Clause 407 Frequency of biological monitoring

⁴ Work Health and Safety Regulation 2017 Clause 394 Meaning of lead risk work

⁵ Work Health and Safety Regulation 2017 Clause 415 Removal of workers from lead risk work

⁶ Work Health and Safety Regulation 2017 Clause 403 Notification of lead risk work

⁷ Work Health and Safety Regulation 2017 Clause 415 (2) Removal of worker from lead risk work

⁸ Work Health and Safety Regulation 2017 Clause 413 Duty to give health monitoring report to Regulator.

⁹ Work Health and Safety Regulation 2017 Clause 403 (3) Notification of lead risk work

Consumption of food and beverages

Issue	Response
Site inspections noted the preparation and consumption of food and beverages in areas where there is a risk of lead exposure such as laundry rooms, control rooms and processing plant offices. Some of the areas were observed to be noticeably dirty and dusty and indicated that they were not cleaned on a regular basis.	Mine operators must take all reasonable steps to ensure that a person does not eat, drink, chew gum, smoke or carry materials used for smoking in lead process areas. Dedicated meal rooms must be provided ¹⁰ . These should be located appropriately for all workers and cleaned regularly.

Provision of changing and washing facilities

Issue	Response
Washing facilities for removing lead or lead compounds (hand washing and boot washing) were either not readily available, not used, not maintained, or not supplied at all or not appropriately located. These facilities were observed to be absent from the exits of some lead risk areas, at the entry to dedicated meal rooms and clean areas such as offices.	Sites are required to provide and maintain washing facilities in the workplace to minimise the ingestion, secondary exposure and spread of lead contamination ¹¹ .
Boot washes and brushes around some sites were observed to be in poor condition and not maintained.	Sites should have inspection regimes in place to ensure lead risk control measures such as boot washes are maintained and remain effective.
At many sites there was observed to be a visible lack of signs and warnings alerting workers they were in a lead risk work environment; and advising workers to exercise lead specific hygiene practices. Signage advising the requirement for handwashing and the use of boot washes before entering meal rooms was found to be absent at some sites. Other sites were shown to lack signage regarding the requirement for washing / showering before leaving site, or the demarcation of clean and dirty sides of bathhouses with dirty clothes and boots observed in the clean side of some facilities.	Workers should be reminded to follow good hygiene protocols before consuming food and beverages in dedicated meal rooms. This includes removing visible dust/dirt from clothing and boots if practicable and thorough hand and face washing prior to entering meal rooms ¹² . Information and training for workers in lead specific personal hygiene protocols and the use of clean in/clean out amenities should be carried out.

Decontamination of equipment

Issue	Response
Site assessments found numerous instances where a process for the cleaning and decontamination of plant and equipment prior to leaving site was either not undertaken or was undertaken but the process was not formally documented or enforced.	Sites must ensure that processes are documented and implemented for the cleaning of lead process areas ¹³ . This should also include any equipment from lead process areas which is removed from site, to prevent the spread of lead contamination.

¹⁰ Work Health and Safety Regulation 2017 Clause 398 (1) Prohibition on eating, drinking and smoking

¹¹ Work Health and Safety Regulation 2017 Clause 399 Provision of changing and washing facilities

¹² Work Health and Safety Regulation 2017 Clause 399 (2) Provision of changing and washing facilities

¹³ Work Health and Safety Regulation 2017 Clause 397 Cleaning methods

Compliance

A summary of notices issued by inspectors in response to identified compliance issues and concerns is presented on the following pages.

Notice	In relation to
<p>Improvement notices, Section 191 <i>Work Health and Safety Act 2011</i></p>	<ul style="list-style-type: none"> • The various boot washes and brushes around the site including the bathhouse were not maintained and in poor condition. • There were no wash facilities provided at the Mill crib room. • Food and cooking facilities were found in the Mill control room. • Dirty clothes were found in the clean side of the bathhouse. • High risk lead activities were conducted in the lab building and workers have had adverse lead monitoring results. The crib room was in the lab building and there was no signs or hand wash facilities in relation to lead management present. • The process of emptying the furnaces of lead contaminated material was conducted with a hand shovel and a standard wheelbarrow. The wheelbarrow was then emptied over a ledge into an open skip bin. This process has the potential to generate lead contaminated dust. • An exhaust fan fitted in the building vents straight outside onto a pedestrian footpath. • A female worker had recorded four adverse blood lead monitoring results in a row even though they had been removed from high-risk lead activities. • Workers in the Mill who are removed from high-risk lead activities are placed in the Mill offices which are located in the middle of a high-risk lead area. • Food, coffee-making facilities and a drinks fridge were observed in the main laundry room adjacent to the washing/drying machines. The laundry is a high lead exposure risk area and has not been identified as a designated crib room. • Coffee-making facilities and a food and drinks fridge were observed in the concentrator workshop/ office kitchenette area. Hygiene signage at a nearby washbasin does not align with site standards regarding lead management, boot washes are not present at all points of entry, and those in place are dirty and ineffective. • Lead processing areas around the lead loadout, lead thickener and lead filter feed sumps were extremely dirty. Spillage in some areas had rendered bunding completely ineffective and lead concentrate was reporting to areas along the rail line.
<p>Notices of concern, Section 23, <i>Work Health and Safety (Mines and Petroleum Sites) Act 2013</i></p>	<ul style="list-style-type: none"> • Components of wording of the Lead Management Plan were not consistent with current legislation in regard to cl 405 of the WHS Regulations, documenting the requirement for health monitoring for a worker commencing lead risk work. • Components of the Lead Management Plan were not consistent with current legislation in regard to the requirement for a review of the

Notice	In relation to
	<p>measures implemented to control health risks from exposure to lead at the workplace.</p> <ul style="list-style-type: none"> • Documentation should be updated to remove references to Safe Work NSW and replace with the Regulator. References to notification processes and forms should also be updated to reflect the process required by the Regulator. • No signs were observed in the change rooms in regard to the requirement for washing/showering before leaving site, nor in the gold room or at the crib room in regard to the requirement for washing hands and face prior to eating. • There was no signage between the clean and dirty side of the bathhouse prohibiting dirty clothes and boots in the clean side. • Boot wash stations outside the crib room and change rooms were missing at the time of the inspection. • Little to no signs were observed in the change room in regard to the requirement for washing/showering before leaving site, nor on the health effects of lead. • Components of the Lead Management Procedure were not consistent with current legislation in regard to the requirements of WHS R 2017 cl 405 for a worker commencing lead risk work (irrespective of previous blood lead results); the frequency of biological monitoring required under WHS R 2017 cl 407; and the current blood lead concentrations for lead risk work (WHS R 2017 cl394) and removal from lead risk work (WHS R 2017 cl415). • An inspection of the male bathhouse found dirty boots and dried mud covering the floor of the clean side. • Boot cleaning facilities adjacent to the old tag board were covered with old water containers and were in damaged and not in a serviceable state. • There was a lack of lead specific hygiene signs observed near hand / boot wash stations at the laundry, crib room, laboratory crib room and concentrate shed. • The front entrance to the workshop and crib room areas lacks a boot wash station and the ad-hoc boot wash located at the rear of the workshop was dirty. • Boot wash stations positioned before entry to change house were dirty and the brushes worn and ineffective. • Eating cutlery, crockery and a drinks fridge were observed adjacent to the main laundry room with washing/drying machines and there was a microwave oven located inside the main laundry room. The laundry is a high lead exposure risk area and has not been identified as a designated eating or drinking area. • The site uses a car wash and wash-down area however, there is no documented process for the decontamination of plant or materials prior to removal from site. e.g. mobile equipment, feed chutes, crushing screens etc. • A contract worker with a recent blood lead level (BLL), exceeding 30ug/dL had attended site. The worker's employer had initiated biological monitoring for the worker but the results had been misallocated and not easily accessible to the mine. Previous biological

Notice	In relation to
	<p>monitoring conducted in 2022 had indicated an increased BLL for the worker but site access had not been restricted.</p> <ul style="list-style-type: none"> • There was a lack of lead specific hygiene signage in the men's and women's change house. • The boot wash outside the surface crib room had worn and ineffective brushes fitted.

Next steps

As required, the Regulator will complete assessments of any health-related incidents concerning managing lead or any other contaminants when they arise. Follow-up investigations of specific incidents may occur that warrant an onsite verification of the mine's controls and/or a review of the associated documentation for managing the risk of lead.

Pro-active assessment activities are also routinely planned for the sites that were inspected as part of this program and any actions specified from previous assessments will be followed up by inspectors. One such program that was underway within the metalliferous sector was the compliance priority project targeting the management of hazardous chemicals. This project will reemphasise the importance of having robust and effective controls for managing substances such as lead, so as to ensure the health and safety of workers.

Further targeted interventions may be initiated, subject to the findings of planned inspection programs, and the frequency and circumstances of lead related incidents into the future.

Issued by

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Regional NSW

Further information

For more information on targeted intervention programs, the findings outlined in this report, or other mine safety information, please contact us. You can find the relevant contact details below.

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