

Submission  
No 57

**INQUIRY INTO CURRENT AND POTENTIAL IMPACTS OF  
GOLD, SILVER, LEAD AND ZINC MINING ON HUMAN  
HEALTH, LAND, AIR AND WATER QUALITY IN NEW  
SOUTH WALES**

**Organisation:** Inland Rivers Network

**Date Received:** 4 September 2023

---



I N L A N D  
R I V E R S  
N E T W O R K

---

PO Box 216, DUBBO NSW 2830

web [inlandriversnetwork.org](http://inlandriversnetwork.org)  
ABN 34 373 750 383

Dr. Amanda Cohen MLC  
Chair Portfolio Committee 2 – Health  
Parliament House  
Macquarie St  
Sydney NSW 2000

Monday 4 September 2023

### **Submission**

**Inquiry into current and potential impacts of gold, silver, lead and zinc mining on human health, land, air and water quality in New South Wales.**

#### **Introduction**

The Inland Rivers Network (IRN) is a coalition of environment groups and individuals that has been advocating for healthy rivers, wetlands and groundwater in the Murray-Darling Basin since 1991.

We welcome the opportunity to provide evidence to this important NSW Government process. This submission is in response to Terms of Reference 1(b) with specific focus on the impact on catchments and waterways, and on aquatic biodiversity.

#### **Background**

A significant concentration of heavy metals mining has occurred in Central West NSW. This region is the focus of planned expansions of the industry. The history of poor management and regulation of the mining industry has led to significant long-term cumulative impacts on surface and groundwater sources through heavy metal pollution.

The assessment of any additional heavy metal extraction must consider legacy issues from past poorly managed operations and rehabilitation. Projects in new areas must protect existing background levels of aquatic biodiversity.

These inland waterways are within the Murray-Darling Basin with new requirements to better manage sustainable water use and improve water quality under the Basin Plan. Guidelines<sup>1</sup> have been developed to better manage heavy metal toxicity in freshwater ecosystems with the aim of protecting aquatic biodiversity. IRN is concerned that the assessment, impact mitigation and regulation processes for heavy metal mining operations in inland NSW pay inadequate regard to maintaining healthy aquatic biodiversity.

There is a history of significant shortfall in water availability for mining operations in the Central West, particularly dust management, during recent severe and prolonged droughts. The interception of rainfall runoff and flows to streams and rivers combined with groundwater drawdown has a significant impact on aquatic biodiversity when combined with heightened levels of toxic heavy metal exposure in the environment.

Climate change predictions for the Central West indicate increased drying conditions and reduced rainfall runoff. This has major implications on any new developments requiring access to water and causing additional water interceptions across the landscape.

### **Macroinvertebrates**

Macroinvertebrates are abundant in healthy waterways and form a critical part of the aquatic food chain. They are highly sensitive to toxicity of heavy metals and are used as indicators to determine water quality and pollution levels.

Metals bound to sediments in waterways is a key source of impact to sensitive macroinvertebrates such as the mayfly (*Deleatidium spp*) and caddisfly (*Pycnocentria spp*). Total abundance and species richness decrease with increasing heavy metal concentrations.

Bioaccumulation occurs in the aquatic food chains as a result of the nondegradable state of the heavy metals. Fish species can be impacted through an increase or decrease in haematological indices, with decline in protein and glycogen reserves.

Native fish populations in the Murray-Darling Basin have been severely impacted by a range of human activities over time. Increased loads of heavy metals in waterways depleting food sources and causing bioaccumulation is an important consideration for Central West waterways and connected groundwater systems.

### **Case Studies**

#### **1. Cadia Gold Mine**

The Cadia Gold Mine near Orange has had a long history of water impacts on the surrounding environment. The loss of flows in downstream waterways due to the interception of rainfall runoff on the mine site has caused significant loss of aquatic biodiversity.

Cadia Mine has been impacted by recent severe droughts through lack of water availability. This has impacted on ability to suppress dust emissions that can enter surrounding waterways and cause heavy metals to bind to soils and sediments in catchments.

---

<sup>1</sup> Australian and New Zealand Environment and Conservation Council, 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*



The management of the very large tailings dams on Cadia Mine site is another key area of concern. These are a source of highly concentrated heavy metals in the regional environment. The collapse of a tailings dam wall during an extreme wet weather event raises questions about the adequacy of the engineering design and safety of these structures over time.

The failure to repair the damaged tailings dam wall has caused a significant source of heavy metal exposure to the environment of the Central West.

## **2. McPhillamy's Gold Mine**

The proposal to intercept rainfall runoff and groundwater across the headwaters of the Belubula River will have a significant impact on aquatic biodiversity in the Upper Lachlan valley.

This proposed mine was approved without all water requirements for mining operations being met. This has implications on the ability to suppress dust and heavy metal contamination during drought conditions. The NSW Government is proposing a special licence allocation that will take water directly from the environmental share under the applicable water sharing plan. This is in contravention of the objects of the *Water Management Act 2000*.

The granting of a special water licence to the McPhillamy's mine will have a direct impact on the aquatic biodiversity of the region.

The proposed tailings dam structure is a direct threat to downstream river health if it fails to hold back dumped toxic heavy metals in extreme wet weather events, as has occurred at Cadia Mine.

## **3. Bowden's Lead, Zinc and Silver Mine**

The proposal to intercept rainfall runoff and groundwater from the catchment of Lawson Creek will have a significant impact on aquatic biodiversity in the Cudgegong River and Upper Macquarie valley.

Lawson Creek provides habitat for a number of threatened native fish species, including Murray Cod, Southern Purple Spotted Gudgeon and Murray-Darling Basin Eel-tailed Catfish. An increase in heavy metal loads will cause increased risk to these threatened species. The assessment of aquatic habitat in the vicinity of the proposed mine was very poor.

The approval for up to 1.6 million litres of water per day to leak from the tailings dam into the Lawson Creek catchment will have a significant impact on the aquatic biodiversity and threatened fish species survival through heavy metal contamination.

This proposed mine will not have adequate water supply for mining operations, including dust suppression, during even a minor drought. This will cause an increase in air borne heavy metal contamination that will pollute soils, sediments and water ways.

There are other significant impacts from the extraction of heavy metals in this catchment including acid mine drainage, tailings dam failure, a toxic pit lake left in the landscape in perpetuity. The long-term management of these polluting sources has not been identified.

**Recommendations:**

1. The assessment of baseline aquatic ecosystem health must be more rigorous
2. Consideration of cumulative impact on biodiversity and ecosystem function must be a key requirement of heavy metal mines assessment
3. Independent expert onground assessment must be a requirement for both the Department of Planning and the Independent Planning Commission with adequate resources to employ independent experts
4. More rigorous assessment of water availability in regard to climate change predictions and limitations for sustainable water extraction
5. Higher penalties and stronger conditions for mining operations must be in place to prevent heavy metal contamination of the environment and community

For more information on this submission please contact:

Bev Smiles, President IRN