

Submission  
No 72

**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:** Mudgee Region Action Group

**Date Received:** 5 September 2023

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Partially  
Confidential



**Submission in response to the inquiry into the current and potential impacts of gold, silver, lead and zinc mining on human health, land, air and water quality in New South Wales**

Prepared by Mudgee Region Action Group  
September 2023

## **CONTENTS**

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>RECOMMENDATIONS.....</b>	<b>3</b>
<b>BACKGROUND .....</b>	<b>4</b>
<b>KEY ISSUES.....</b>	<b>5</b>
<b>RISK MATRIX.....</b>	<b>12</b>
<b>CONCLUSION.....</b>	<b>15</b>

## **EXECUTIVE SUMMARY**

Mudgee Region Action Group (MRAG) welcomes the opportunity to participate in the NSW Legislative Council's Portfolio Committee No. 2 – Health inquiry into the current and potential impacts of gold, silver, lead and zinc mining on human health, land, air and water quality in New South Wales.

To illustrate how the planning and regulatory framework for assessment and approval of heavy metals and critical minerals mining in New South Wales is not currently fit for purpose, this submission will outline key failures in the assessment and approval of the Bowdens lead, zinc and silver project (SSD-5765) at Lue, near Mudgee in Central West NSW.

It is based on the assessment and review of key impacts of the Bowdens project by several independent technical experts and advisors, and it addresses the Inquiry Terms of Reference (a) through (c), and (i), specifically:

- (i) Any other related matters. In particular:
  - a. the inadequacy of proposed acid mine drainage risk management;
  - b. impacts to tourism and the visitor economy;
  - c. social impacts; and
  - d. impacts to property value.

**In this case, project approval was granted prematurely during a period of caretaker government, despite:**

- a lack of technical resolution across key aspects of mine viability impacting human health and the broader environment - as evidenced by 11 of 12 Secretary's Environmental Assessment Requirements being accepted as incomplete and pushed to post-approval management plans; and
- no assessment of the impact on economically valuable and sustainable industries like tourism and agriculture in the region.

If the NSW Government is to execute on [its strategy to position NSW as a major global supplier and processor of critical minerals and high-tech metals](#), it must ensure these mining projects are assessed and then held to the highest possible standard.

This submission will alert the Inquiry to significant gaps and shortcomings in the Bowdens Environmental Impact Statement, and the subsequent NSW Department of Planning & Environment and NSW Independent Planning Commission's assessment of the project.

## **RECOMMENDATIONS**

1. Use this opportunity to undertake a comprehensive review of the decision to grant approval to the Bowdens Project. Stop assessment of Mining Lease Application MLA601 until technical shortcomings in the proponent's EIS and associated assessment are addressed.
2. Review the classification and definition of what constitutes a critical mineral or a high-tech metal, and weigh this against the social, economic and environmental costs of extraction in NSW. In particular in areas of likely incompatibility with other industries, like tourism and agriculture.
3. Amend the *Environmental Planning & Assessment Act 1979* (NSW) to reinstate the right to bring appeals on the basis of merit in the NSW Land & Environment Court for future State Significant Development decisions.

## **BACKGROUND**

The Bowdens project is a greenfield development of an open cut lead, zinc and silver mine in the popular Mudgee-Rylstone tourist district, two kilometres from Lue village and primary school.

[Conditions of consent include routine blood lead level testing of surrounding community](#), including babies and children.

*Bowdens Project Overview (see further figure 1):*

- 1,825ML water take per annum. No external water supply. Located at the headwaters of the Lawson Creek, which flows into the Cudgegong River at Mudgee and on to Burrendong Dam.
- Three open cut pits (52 hectares)
- Tailings dam (117 hectares)
- Estimated ore volumes over life of mine:
  - Lead – 130,000 tonnes
  - Zinc – 190,000 tonnes
  - Silver – 1,417 tonnes
- Acid-forming waste rock dump (77 hectares)
- A processing plant and associated infrastructure
- Low grade ore and oxide ore stockpile (22 hectares)
- Final void (53 hectares)
- Life of mine: 23 years. Active exploration underway closer to Mudgee and Rylstone townships under Exploration Licences EL5920, EL6354, EL8159, EL8160, EL8168, EL8268, EL8403, EL8405, EL8480 and EL8682 (see figure 2.)

Mudgee Region Action Group is run by volunteers who are local Lue residents, landholders and residents of the surrounding Mudgee, Rylstone and Kandos areas.

Our financial members together have stewardship of over 20,000 hectares of productive agricultural and tourism land around the mine site, representing a benchmark earning value of over \$14.6 million per year, which largely goes back into our community and region.

We are not anti-mining, and we are not anti-development. We came together in 2011 to understand the impacts of the proposed Bowdens project, and to ensure development for the region is undertaken responsibly.

Our group represents nearly 500 people today, predominantly from the Lue, Mudgee, Rylstone and Kandos area. Over 4,400 people [have signed a petition against the Bowdens project](#), including many of the interstate and international visitors attracted to visit the world-renowned Mudgee region each year (826,000 people in 2020-21).

*Current Project status:*

The NSW DPE recommended the project for approval on 23 December 2022, during a period of caretaker government.

On 3 April, 2023 the NSW Independent Planning Commission approved the project in the absence of key mine-viability determining information.

Of the 12 Secretary's Environmental Assessment Requirements (SEARs), 11 are unresolved and were pushed to post-approval management plans. This means major technical issues dealing with fundamental control of project risks have been pushed to the post approval stage, to be dealt with in yet-to-be created Management Plans.

Current planning legislation in NSW means the community has been denied the right to appeal the decision to approve the project on its merit.

## **KEY ISSUES**

### **1. Impact on health of local residents as a result of exposure to lead and lead dust**

#### *Lead Dust and Human Health – Professor Mark Taylor<sup>1</sup>*

- There is no safe level of exposure to lead for humans or biota. There are thresholds of 'acceptability' but these should not be confused with levels of safety.<sup>2</sup>
- Increased dust and lead concentrations in ambient environment present risk to the local community. There is evidence that short-term exposures are equally problematic to human health.<sup>3</sup>
- Dust will be the key pathway for lead contamination.<sup>4</sup>
- Pollution will be dispersed under prevailing winds across community and adjacent agricultural producing sites.<sup>5</sup>
- No mine can demonstrate no off-site impacts. Elevated blood leads exist around mines, even after ceasing operation.<sup>6</sup>
- Bees and biota mobilise Pb-rich dust, demonstrating that pollution will leave the site and be remobilised into environmental and food systems.<sup>7</sup>
- The proposal should re-evaluate its impact on the community using the most up to date and world's best dust standards and also take into account impacts on food quality and ecological disturbance behaviours arising from contaminant exposure.<sup>8</sup>

#### *Human Health – Professor Barry Noller<sup>9</sup>*

- There is significant risk in relying on modelling alone to estimate environmental impacts and health effects in relation to air quality and noise regarding any specific impacts on the health of the local community.<sup>10</sup>
- Attention will be required with selecting dust monitoring methods to provide sufficient detail to enable management measures to be put in place to assess lead exposure at Lue. Decision makers must ensure that measurements are performed for lead dust dispersion and that lead deposition in fallout is not based solely on modelling calculations.<sup>11</sup>
- The NSW EPA uses an outdated guideline for assessing building contamination from lead and does not have a current floor contamination method for lead that meets a blood lead level of 5 ug/dL.<sup>12</sup>
- A case non-availability of sufficient stored water (as supported by Shireen Baguley 2023) for dust suppression may result in increased dust dispersion increasing lead.<sup>13</sup>
- It remains important to get all residents and particularly children tested for blood lead.<sup>14</sup>
- One of the most important contaminants in air at Bowdens is crystalline silica. This needs to be measured in the PM2.5 fraction to follow international best practice. Because PM2.5

<sup>1</sup> Mark Taylor is a Professor of Environmental Science and Human Health at Macquarie University, Sydney, specialising in environmental contamination. He is the Chief Environmental Scientist at EPA Victoria.

<sup>2</sup> Taylor, M, Talking points for the Bowden's Mine IPC Hearing, Page 4.

<sup>3</sup> Taylor, M, Page 1.

<sup>4</sup> Taylor, M, Page 1-2.

<sup>5</sup> Taylor, M, Page 1.

<sup>6</sup> Taylor, M, Page 1.

<sup>7</sup> Taylor, M, Page 2.

<sup>8</sup> Taylor, M, Page 2.

<sup>9</sup> Professor Noller is an environmental scientist who studies the pathways and processes of metals and metalloids in the environment. He applies environmental chemistry and toxicology with risk assessment tools to identify issues of human health and environmental effects in biota.

<sup>10</sup> Noller, B, Statement on Proposed Bowden's silver mine at Lue, February 2023, Page 1.

<sup>11</sup> Noller, B, Page 2.

<sup>12</sup> Noller, B, Page 5.

<sup>13</sup> Noller, B, Page 5.

<sup>14</sup> Noller, B, Page 5.

particulate matter is ultrafine particles it can be dispersed far more widely than larger size particles in dust deposition.<sup>15</sup>

### Air Quality Assessment

- Inconsistency with the configuration of diagnostic meteorological model (CALMET) means modelling relied on may not accurately capture the complex local topography surrounding the site. The meteorological modelling domain extent was large. If a smaller modelling domain had been adopted, the accuracy of the air quality predictions at the mine site and surrounding sensitive receptors would have been improved.<sup>16</sup>

## **2. Impact on catchments and waterways (ground and surface water), and on endangered groundwater dependent ecosystems**

### Surface water impacts – Shireen Baguley<sup>17</sup>

The project's Secretary's Environmental Assessment Requirements (SEARs) have not been met. The proponent has failed to provide:

- A detailed site water balance, including an assessment of the reliability of water supply imported to the site, and management of excess water, supported by sensitivity analysis.
- An assessment of the water quality and management of the imported water, including spill/leak management.<sup>18</sup>

Additional issues regarding the SEARS include that:

- The proposed project's water demand has not been clearly identified.
- The full impacts of drawing both the stated and the actual water supply requirements of the proposed project from the affected catchments have not been assessed.
- An adequate and secure water supply is not available for the project.
- The water balance modelling is not supported by a full sensitivity analysis, and only considers water quantity. There is no site water quality model to fully assess potential impacts on receiving waters.
- The water quality monitoring program is undeveloped and there is no management plan to address spill/leak management.<sup>19</sup>

Significant areas of concern around other impacts to surface water include:

- It is unclear what the true area of the Mine Site catchment is, which casts uncertainty over the modelled impacts.<sup>20</sup>
- There is a high level of uncertainty with regards to the AWBM water balance model and its sensitivity to key parameters.<sup>21</sup>
- The likely impact of the mining operations on the surface water is considered unacceptable.<sup>22</sup>
- Bowdens modelled water availability is flawed and contradicts actual data collected at Monivae (directly upstream of the mine site) in February 2023, which found a current flow rate in Lawson Creek of 0.38ML/d, which is less than 2% of that reported by WRM (2022).<sup>23</sup>

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<sup>15</sup> Noller, B, Page 6

<sup>16</sup> Air Environment, Technical Review of Ramboll Australia's Report – Bowden Silver Mine EIS Air Quality Assessment, September 2023, p 9.

<sup>17</sup> Shireen Baguley is a civil engineer with nearly 30 years' experience in hydrology, water management and impact assessment. She holds a Bachelor's degree in engineering (Civil) (Hons 1) and a Masters in Engineering Science (Water Resources). She is a Certified Lead Environmental Auditor and has been approved by the Department of Planning and Environment to conduct independent environmental audits on a range of state significant developments across NSW.

<sup>18</sup> Baguley, S, Proposed Bowdens Mine SSD 5765 Surface Water Submission Report to the IPC, Feb 2023, Page 8.

<sup>19</sup> Baguley, S, Page 8.

<sup>20</sup> Baguley, S, Page 16.

<sup>21</sup> Baguley, S, Page 26.

<sup>22</sup> Baguley, S, Page 32.

<sup>23</sup> Baguley, S, Page 37.

- There are several regulatory irregularities which must be addressed. Specifically relating to:
  - the quantity and status of water being taken under “harvestable water rights”, and;
  - the stated intention to harvest water from sediment basins.<sup>24</sup>
- The impact on Groundwater Dependant Ecosystems (GDEs) has not been properly considered.<sup>25</sup>
- There is simply not the water available to take the quantity required to sustainably operate the proposed mining project.<sup>26</sup>

#### Groundwater impacts –

27

- The effectiveness of the current regulatory framework to consider project SSD-5765 is significantly diminished by the time taken for EIS preparation ([FDP, Aug 2021](#)).
- Fundamental matters raised in 2020 have still not been addressed ([FDP Feb 2023](#) pp. 47-48, 53-57 and [FDP, Aug 2021](#) pp7-11). [LAG \(2020a\)](#) provides recommendations where the response to the SEARS might be improved.
- The issue of inconsistencies is compounded by the heavily conditional Determination granted in 2023. It obliges future regulators to safely manage risks without public scrutiny, yet there is presently insufficient data for a robust Trigger Action Response Plan or Water Management Plan required under the framework.
- An example of an inconsistency is the lack of hydrogeological investigations between Lue village and the site. [LAG \(2020\)](#) shows a [misrepresentation](#) of Bowden’s water quality analysis. The MODFLOW groundwater modelling did not model the likely movement or attenuation of acid and heavy metals as they leave the site.
- The mass/year of contaminants within this possible water supply that may possibly be concentrated by reverse osmosis treatment and sent to the tailings storage facility is not provided and thus not assessed.
- Modelling of the nature, mass or attenuation of contaminants leaching from the tailings storage facility or waste rock emplacement to the south and west of the Mine Site after 100 years has not been presented.
- A second matter relating to the regulatory framework is that very few of the Recommendations provided by EPA and DPIE/NRAR were resolved pre-approval. Neither entitlements to the maximum required water supply from Groundwater Sources, nor alternatives were obtained.
- FDP’s conceptual diagrams ([15 Feb 2023](#) p.16) indicate the potential for pit dewatering from Year 4 to drain surrounding catchments and also for indefinite contaminant seepage on abandonment.
- A third matter is the lack of any risk assessment following recognised guidelines. A peer reviewed AS/NZS ISO 31000:2009 Risk Assessment would enable source-pathway-receptors to clearly conceptualise the problems.
  - i) Significant or unique endemic species in groundwater dependent ecosystems are not presented for consideration
  - ii) 106 licensed and unregistered bore users within 10 km do not have an activity-pathway-likelihood-consequence risk assessment ([FDP Feb 2023](#) p.57)
- This risk assessment was also recommended by the DPIE expert ([FDP Feb 2023](#)).
- This project approval pathway is an opportunity to demonstrate leading practice in project approvals and demonstrate alignment with WaterNSW strategy and principles for sustainable development.

<sup>24</sup> Baguley, S, Page 43.

<sup>25</sup> Baguley, S, Page 48.

<sup>26</sup> Baguley, S, Page 55.

<sup>27</sup> is a hydrogeologist and Chartered Environmental Engineer working on national and international groundwater projects. He is an active member of the International Association of Hydrogeologists, the Hydrological Society and Engineers Australia.



- There is potential for leakage into groundwater and spillage into the downstream waterways such as Lawsons Creek that flow through the townships of Lue and Mudgee.<sup>29</sup>
- Contamination of groundwater and surface waters would result in the subsequent and permanent reduction of catchment biodiversity and availability of water for community stock and domestic usage.<sup>30</sup>
- The underlying aquifer is unconfined with highly heterogenous; fractured rock and the proposed tailings storage facility (TSF) lies on mapped faults with one fault trending southeast through Lawsons Creek, and;
- There is a high probability of connectivity between the groundwater and surface water resulting in a high probability of impact exchange between the water sources.<sup>31</sup>
- There is a lack of definition of what constitutes groundwater and therefore what is a Groundwater Dependent Ecosystem (GDE) and what is not.<sup>32</sup>
- There are a high number of springs, peatlands, bogs and montane mires adjacent and within the Bowdens site. Likely listed under protected Montane Peatlands and Swamps Endangered Ecological Community (EEC) listing under *Biodiversity Conservation Act 2016* (NSW) and the Temperate Highland Peat Swamps on Sandstone EEC under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).
- DPIE Assessment Report is silent on the sensitive taxa that are strong indicators of persistent high-water quality and quantity, as well as water permanence within pools, again confirming ground and surface water connectivity.<sup>33</sup>

### 3. Impact on livestock and animals

#### Lead poisoning in animals –

34

Farm and production animals:

- The Livestock Production Assurance (LPA) program is the on-farm assurance program that underpins market access for Australian red meat. Lead is one of the four contaminants specifically listed in the [Livestock Property Assurance factsheet](#).
- LPA National Vendor Declarations (NVDs) provide evidence of livestock history and on-farm practices when transferring livestock through the value chain.
- Property risk assessments ensure the integrity of the meat we produce, guaranteeing it's safe and of high quality.
- If livestock encounter persistent chemicals, the meat produced may contain unacceptably high chemical residues, impacting on food safety and market access.
- Repercussions of selling livestock with unacceptable levels of persistent toxins or physical contaminants, may include loss of market access, failure to be paid for the livestock, and possible legal liability for the resulting costs faced by processors and the rest of the supply chain.
- Blood testing of poisoned mammals is often too late as the symptoms are generally permanent. In baby animals (and human children) there is no safe blood levels for lead.
- Lead is mainly absorbed by animals into the system by ingestion. Lead is sweet and is often sought out and swallowed for that reason. The major source is dust containing lead.

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<sup>28</sup> Peter Serov is an aquatic and groundwater ecologist, and invertebrate taxonomist who has worked in a range of environments including surface aquatic, marine, terrestrial, and groundwater ecosystems. He specialises in the ecology and identification of stygofauna (groundwater fauna), and is recognised as the Australian authority on the Syncarida (both the Anaspidacea and Bathynellacea)

<sup>29</sup> Serov, P, Independent Desktop Review of the Bowdens Silver Pty Limited for the proposed Bowdens Silver Mine: EIS Review Updated, February 2023, Page 1

<sup>30</sup> Serov, P, Page 1

<sup>31</sup> Serov, P, Page 1

<sup>32</sup> Serov, P, Page 3.

<sup>33</sup> Serov, P, Page 3.

<sup>34</sup> is a veterinarian with 50 years' experience in the Mudgee district, including observing the effects of lead poisoning on livestock.

Bees:

- Bees are a significant agricultural enterprise, both as honey producers and as pollinators of orchards and other agricultural crops.
- Neither the EIS nor the DPE Assessment addressed this issue.
- Pre-eminent lead expert Professor Mark Taylor in a recent study showed that bees are affected by lead. They grow with smaller heads. Cognitive impairment results in loss of memory and affected bees cannot find their way home to the hive.
- Bees and biota mobilise Pb-rich dust, demonstrating that pollution will leave the site and be remobilised into environmental and food systems.<sup>35</sup>

#### 4. Inadequacy of proposed acid mine drainage risk management

##### Acid Mine Drainage Issues – Michael White<sup>36</sup>

The Department of Planning's assessment of the Bowdens Project included an AMD independent expert review by Earth Systems.<sup>37</sup> This review raised numerous significant concerns (see the four review documents provided to DPE by Earth Systems dated between May and December 2022), including:

##### *Lack of Accurate Classification of Potentially Acid Forming (PAF) and Non Acid Forming (NAF) Material:*

- This is fundamental to the basic mine design and is critical to ensure that no PAF material is placed outside containment areas.
- It is critical to ensure that PAF waste dumps have sufficient capacity to store all PAF material.
- It is critical to ensure there is sufficient NAF material for construction and rehabilitation requirements.

##### *An Unproven and Substantially Problematic Design of the Waste Rock Emplacement Area (WRE):*

- In order for the community and government to be satisfied that such designs as contained in this Project proposal are effective, safe and successful in both the short and long term there would need to be evidence of this at similar scale elsewhere.
- The Proponent has not identified any other mine sites where the use of this design and technology at this scale has been successfully employed in either the short term or the long term.
- The WRE and Tailings Storage Facility (TSF) AMD management strategy/closure design presents the post closure risk of requiring water treatment in perpetuity
- The Store and Release Cover System proposed for both the WRE and the TSF are not suitable for AMD control

##### *The Final Void Water "Through Flow" Risk has not been resolved*

- The Department's own independent groundwater expert review by Hydrogeologic<sup>38</sup> raised concerns that there was a greater than 50% probability of the through flow of contaminated water from the final void to the surrounding environment post closure.
- Bowdens Proposed Final Void Mitigation option (which has not been assessed in the EIS) is to increase the surface area of the final void and the final void lake to increase evaporative losses.

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<sup>35</sup> Taylor, M, Page 2.

<sup>36</sup> Michael White has more than 25 years' experience as a mining engineer in the resources sector, with 24 years' senior operational and technical experience with BHP across a range of commodities including manganese, diamonds, metallurgical and thermal coal. He holds a Bachelor of Engineering (Mining), Honors II from the University of Sydney, and an MBA from Deakin University.

<sup>37</sup> <https://www.planningportal.nsw.gov.au/major-projects/projects/bowdens-silver-temp>

<sup>38</sup> [DPE, Bowdens Silver Assessment Report, December 2022, page 35, paragraph 174](#)

- While the DPE's independent water expert acknowledges that this would resolve the through flow risk this proposed solution would require an increase in the final void footprint of between 16.6 ha and 28 ha. The EIS final void design footprint is 53ha. An additional 28ha is an increase of 52% in final void footprint.
- This 28ha increase would require moving an additional 16.3 million bank cubic metres of rock.
- The total EIS volume of material (that is all the ore and all the waste rock for the entire project) to be removed from the currently proposed open cut pit is approximately 32.5 M cubic metres.
- This "solution" would require Bowdens to **move 50% more total material over the project life for no additional revenue**. At \$3-\$4 /bank cubic metre this is would be an additional closure cost of between \$49M and \$65M. The Current EIS mine rehabilitation and Closure costs are \$39.4M. This would increase mine rehabilitation and closure costs to between \$88.4M and \$104.4M (an increase of 224% - 265%).
- Other impacts of this major change to the final landform have not been assessed in the EIS.
- Major unresolved technical issues dealing with fundamental controls of agreed risks (AMD) do not belong to be solved in Conditions of Consent Management Plans.
- This project's location is unsuitable as an experimental test site.<sup>39</sup>

## 5. Impacts to tourism and the visitor economy

### Tourism, visitor economy and economic impacts – Karl Flowers<sup>40</sup>

- The DPE Assessment Report excludes any meaningful mention or exploration of the role tourism, agriculture and the visitor economy plays to the region, and fails to assess the impacts of the project on these industries.
- 691,000 visitors to the Mudgee region per annum in the four years ending 2019. 826,000 in 2020-21.<sup>41</sup>
- 931 jobs directly due to visitor spending in 2020-21. Tourism spending in 2020-21 provided six times, and when combined with agriculture, 12 times, the expected number of jobs from the Bowdens' project.<sup>42</sup>
- Wine, nature and dining out are key activities of overnight domestic visitors in the region – all relying on a reputation for pristine natural environments. Visitors to the area also have significantly higher incomes, and may be more concerned about environmental toxins with lead mining than visitors to the larger region.<sup>43</sup>
- Mudgee Region Destination Management Plan 2020-25 lists wellness tourism as a key experience theme. Conflict between attracting tourists interested in high-quality wine, food and wellness and risks posed by lead mining, like lead contamination and acid mine drainage.<sup>44</sup>

## 6. Social impacts

### Social impacts – Dr Alison Ziller<sup>45</sup>

- Social impacts of gold, silver, lead mining, including their adverse impacts on public health, spatial disadvantage due to proximity to mining are not adequately balanced against the financial interests of proponents or the NSW Government.

<sup>39</sup> White, M, Supplementary Submission on SSD-5765 to the IPC, February 2023, Page 2.

<sup>40</sup> Karl Flowers was Tourism and Aviation Economist at Tourism Australia for seven years, Director Tourism Investment in the Commonwealth Department of Tourism for six years and General Manager, Policy and Research at Australia's largest tourism industry association (TTF Australia) for six years, after starting his career with Federal Treasury.

<sup>41</sup> Flowers, K, Mid-Western Regional Council Area Visitation and Economy, 2023, Page 1.

<sup>42</sup> Flowers, Page 1.

<sup>43</sup> Flowers, Page 2.

<sup>44</sup> Flowers, Page 3.

<sup>45</sup> Alison Ziller is a lecturer in Social Impact Assessment at the Macquarie School of Social Sciences, Macquarie University. She holds a PhD, School of Urban and Regional Planning, The University of Sydney.

- Inadequate mitigation of social impacts. Proposal fails to meet criteria for best practice mitigation of social impacts, as considered by the NSW Land and Environment Court in *Gloucester Resources Limited v Minister for Planning* [2019] NSWLEC 7.<sup>46</sup>
- Chief strategy for mitigating exposure to lead is discovery post facto. This does not represent durably effective mitigation for a substance whose harmful effects cannot be remedied, reversed or removed.<sup>47</sup>
- Social Impacts Management Plan [SIMP] described in the Department's Assessment Report (DAR 402-406 & 411) is a list of mitigations giving the risks of physical exposure to lead dust the same priority as local businesses strategy and workforce accommodation. It also inappropriately places responsibility for the consequences of exceedances on individual landholders.<sup>48</sup>
- NSW DPE Recommended Conditions of Consent for mitigating social impacts are short term and lack substance (no detail or enforceability). They will not address the lived experience of residents. Case for net social benefit cannot be made for this project.<sup>49</sup>

## 7. Impact on property value

### Property value impact – Peter Druitt<sup>50</sup>

- More than 150 properties in close proximity to the mine site, 55 of which are homes and properties in Lue village. Range from large agricultural enterprises, family farms, homes, rural residential blocks, farm stays, tourism accommodation, and a public school.<sup>51</sup>
- In excess of 150 properties in the area, including downstream on Lawson Creek, have potential to be impacted by the project.<sup>52</sup>
- Two specific aspects of the project that will impact property prices: impact on lifestyle caused by visible mine infrastructure, noise, dust, traffic; and reduction in water quality or water quantity, particularly for larger working farms.<sup>53</sup>
- Bylong Valley Coal Project provides a useful case study of market impact from mining in a rural, greenfield area.<sup>54</sup>
- Negative price impact on property value of between 20 – 30 percent.

<sup>46</sup> Ziller, A, Submission re. likely social impacts of the proposed Bowdens Silver Mine, Page 10.

<sup>47</sup> Ziller, A, Page 10.

<sup>48</sup> Ziller, A, Page 8 – 9.

<sup>49</sup> Ziller, A, Page 10.

<sup>50</sup> Peter Druitt is a rural property specialist with over 40 years experience. He is an honorary life member of the Australian Livestock and Property Agents Association.

<sup>51</sup> Druitt, P, Property value impact assessment, 2023, Page 1.

<sup>52</sup> Druitt, Page 1.

<sup>53</sup> Druitt, Page 1.

<sup>54</sup> Druitt, Page 2.

## RISK MATRIX

The below table demonstrates the elevated risk profile of the Bowdens project. It summarises the impacts for the region if models relied on by the NSW DPE and Independent Planning Commission are valid. It also summarises the impacts if modelling by independent experts is valid.

Concern raised by Independent Expert(s)	Bowdens, NSW DPE and IPC assumptions	Consequence if NSW DPE and IPC assumptions are valid	Independent Expert advice	Consequence if Independent Expert advice is valid
Lead contamination in air and water <i>Lead Dust and Human Health – Human Health –</i>	Lead in people will increase, but levels will be too low to cause ill effects; blood testing will monitor blood lead impact and inform people so they can “minimise adverse outcomes”	If lead levels in blood are found to be high through testing, adverse outcomes cannot be minimised or reversed.	<ul style="list-style-type: none"> <li>There is no safe level of exposure to lead for humans or biota.</li> <li>Pollution will leave the site and be remobilised into environmental and food systems.</li> <li>There is significant risk in relying on modelling alone to estimate environmental impacts and health effects in relation to air quality.</li> <li>No mine can demonstrate it has no off-site impacts.</li> </ul>	Lead particles disbursed via air contaminate humans, agricultural products, animals and drinking water beyond the site, threatening human health, agricultural produce, and agritourism businesses in the Mudgee region.
Water availability and insecurity <i>Surface water impacts –</i>	1,824 megalitres (over 500 Olympic sized pools) per year is required and will come from the site; impacts to water flows would be very minor	Regional groundwater levels will be lower; impacted residents will have to request water from mine operator’s “compensatory water supplies”	<ul style="list-style-type: none"> <li>Bowdens modelled water availability contradicts actual data collected directly upstream of the mine site, which is less than 2% of what Bowdens modelled.</li> <li>It is unclear what the true area of the Mine Site catchment is, which casts uncertainty over the modelled impacts.</li> </ul>	Those living in the region will suffer from water insecurity for the duration of mining operations and for at least 50 years beyond closure.  There is simply not enough water available to sustainably operate the proposed mining project.

Concern raised by Independent Expert(s)	Bowdens, NSW DPE and IPC assumptions	Consequence if NSW DPE and IPC assumptions are valid	Independent Expert advice	Consequence if Independent Expert advice is valid
<p>Water contamination through Acid Mine Drainage (AMD)</p> <p>Groundwater impacts –</p> <p>Acid Mine Drainage Issues –</p>	<p>Use of 1.5 millilitre store-and-release liners with yet-to-be-developed detailed design and engineering of tailings dam will mitigate AMD</p>	<p>There is the potential for pit dewatering from Year 4 to drain surrounding catchments and for indefinite contaminant seepage on abandonment.</p>	<ul style="list-style-type: none"> <li>The proposed store-and-release cover systems are not considered an appropriate strategy for waste rock or tailings management.</li> <li>There is no modelling of the contaminants leaching from the tailings dam or waste rock emplacement to the south and west of the Mine Site after 100 years.</li> <li>The closure strategy for waste rock emplacement and tailings storage requires water treatment in perpetuity.</li> <li>There is potential for leakage into groundwater and spillage into the downstream waterways such as Lawsons Creek that flow through the townships of Lue and Mudgee.</li> </ul>	<p>AMD and leakage will permanently contaminate Lawsons Creek and downstream water flows from which the town of Gulgong gets its drinking water.</p>
<p>Tailings dam wall collapse</p> <p>Groundwater and aquatic ecology issues –</p>	<p>Single wall will prevent collapse and (what) contamination of surrounding ecosystems</p>	<p>Toxic chemicals will be stored in the tailings dam for thousands of years with no remediation</p>	<ul style="list-style-type: none"> <li>The proposed tailings storage facility (TSF) lies on mapped faults with one fault trending southeast through Lawsons Creek</li> </ul>	<p>Toxic chemicals will be released into the environment causing contamination for thousands of years with no remediation</p>

Concern raised by Independent Expert(s)	Bowdens, NSW DPE and IPC assumptions	Consequence if NSW DPE and IPC assumptions are valid	Independent Expert advice	Consequence if Independent Expert advice is valid
Impact on regional tourism <i>Tourism, visitor economy and economic impacts</i>	Not assessed.	No consideration of impact on regional tourism.	<ul style="list-style-type: none"> <li>• Tourism spending in 2020-21 provided six times, and when combined with agriculture, 12 times, the expected number of jobs from the Bowdens' project.</li> <li>• Visitors to the area also have significantly higher incomes and may be more concerned about environmental toxins with lead mining.</li> <li>• Mudgee Region Destination Management Plan 2020-25 lists wellness tourism as a key experience theme. Conflict between attracting tourists interested in high-quality wine, food and wellness and risks posed by lead mining.</li> </ul>	<p>Transformation of the Mudgee region from a highly valuable tourism destination featuring wine, nature and dining out, attracting 826,000 visitors and supplying 931 jobs in 2020-21, to a region overtaken by mining operations providing only \$38m (best case) and ~200 jobs over 16 years.</p> <p>Loss of high income tourists and wellness tourism due to lead contamination and acid mine drainage impacting food, wine and pristine environment.</p>

## **CONCLUSION**

This submission has illustrated how the planning and regulatory framework for assessment and approval of heavy metals and critical minerals mining in New South Wales is not currently fit for purpose, by detailing key failures in the assessment and approval of the Bowdens lead, zinc and silver project (SSD-5765) at Lue, near Mudgee in Central West NSW.

The project's approval represents a failure of due process, effectively lowering the standard required to assess the impacts of heavy metal mining projects and pushing the determinative issues to the post approval stage.

We acknowledge the New South Wales Government's vision to position NSW as a major global supplier and processor of critical minerals and high-tech metals, however it's imperative that equal priority be placed on proper mine design and the site suitability of proposed mining projects.

It's important the current NSW Government recognise that approval of the Bowdens Lead, Zinc and Silver Project (SSD-5765) was granted during a period of caretaker government, and use this opportunity to undertake a comprehensive review of this decision. This must occur prior to assessment of the Proponent's Mining Lease Application MLA601.

A review of the classification and definition of what constitutes a critical mineral or high-tech metal, and weighing this against the social, economic and environmental costs of extraction in areas of high tourism or agricultural value will also help ensure responsible development of future metals mining projects in New South Wales.

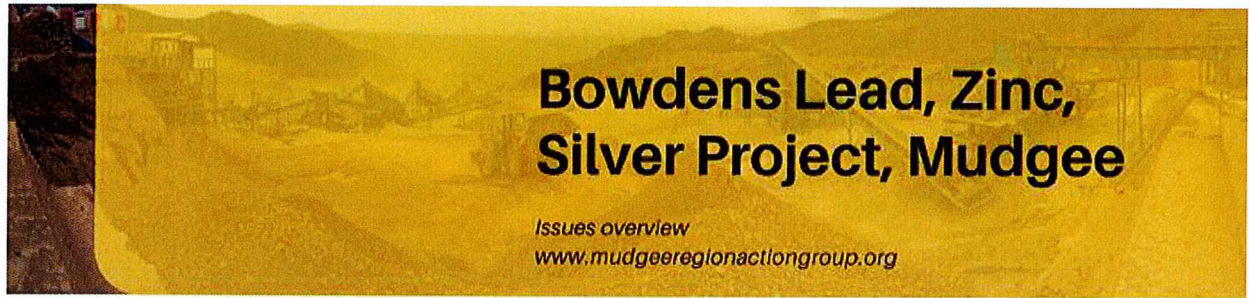
Further, with a suite of similar projects in the pipeline, it will be important that impacted communities have access to the legal system for the purposes of reviewing project approvals on the basis of merit, and the *EP&A Act 1979* (NSW) should be amended accordingly.

**Submitted by: Mudgee Region Action Group, September 2023**

**Contact: Tom Combes, on behalf of Mudgee Region Action Group;**



Figure 1. Overview of Bowdens Lead, Zinc and Silver Project



## LOCATION

Greenfield area; 2km NE of Lue, 26km E of Mudgee, Central West NSW. Lawson Creek catchment - flows to Cudgegong River and Burrendong Dam.

### Project detail:

- Greenfield development
- 1,825ML water take per annum. No external water supply.
- Three open cut pits (52 hectares)
- Tallings dam (117 hectares)
- Acid-forming waste rock dump (77 hectares)
- Low grade ore and oxide ore stockpile (22 hectares)
- Permanent final void (53 hectares)
- Estimated ore volumes over life of mine:
  - Lead - 130,000 tonnes
  - Zinc - 190,000 tonnes
  - Silver - 1,417 tonnes
- Life of mine: 23 years, although active exploration underway closer to Mudgee and Rylstone townships (including current NSW exploration licence application ELA 6610)



**>90X**  
MORE LEAD THAN SILVER



**2KM**  
FROM PRIMARY SCHOOL



**826K VISITORS**  
TO REGION IN 2020-21.

## CURRENT STATUS

NSW Independent Planning Commission approved the mine on Monday, 3 April, 2023. Major technical issues dealing with fundamental control of project risks have been pushed to the post approval stage, to be dealt with in yet-to-be created Management Plans.

## KEY ISSUES

Social, environmental and economic impacts to the region are unacceptable, including:



LEAD



WATER  
QUANTITY AND  
QUALITY



BIODIVERSITY

## IMPACTS

### 1 Lead contamination

130kt of lead will be disturbed. NSW approval requires blood lead level testing to be provided to community, including primary school students. NSW DPE Assessment fails to consider dust borne lead risk to human health, agribusiness and tourism.

### 2 Water quantity and quality

Water intensive project (1825ML per annum), with no external water supply. Water modelling is flawed, and fails to identify and assess impacts on ground and surface water quality and quantity, including from acid mine drainage.

### 3 Biodiversity & Cultural Heritage

Removal of 180ha of Critically Engangered Box Gum Woodland; removal of 139.59ha of core Koala Habitat; removal of 182.27ha of Regent Honeyeater Habitat; destruction of 25 of the 52 surveyed aboriginal artefacts at the site.

Figure 2: Bowdens Silver Exploration Licences. Source [www.bowdenssilver.com.au](http://www.bowdenssilver.com.au)

