NSW Independent Planning Commission
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Lue Action Group
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Friday, 24 February 2023

Dear Commissioners,

RE: OBJECTION TO BOWDENS SILVER PROJECT SSD-5765

This letter sets out the objection of the Lue Action Group to the Bowdens Silver Project at Lue.

The Lue Action Group is run by volunteers who are local residents of Lue and the surrounding area. We came together in 2011 to understand the impacts of the proposed mining operations on our homes and community, and to ensure development for the region is undertaken responsibly.

Our support base numbers nearly 300 today, predominantly from the Lue, Mudgee, Rylstone and Kandos area.

To assist the Commission in making its assessment of the project, Lue Action Group has engaged independent experts across the following key areas to review and provide assessment of the project:

1. Surface water – Shireen Baguley
2. Groundwater – Craig Flavel
3. Aquatic ecology, specifically Groundwater Dependent Ecosystems (GDEs) – Dr Peter Serov
4. Acid Mine Drainage (AMD) management – Michael White
5. Lead & dust particulates – Professor Mark Taylor
6. Human health & AMD risk – Professor Barry Noller
7. Social impacts – Dr Alison Ziller
8. Tourism and the visitor economy – Karl Flowers
9. Property value – Peter Druitt

The majority of these assessments were presented to the NSW Independent Planning Commission during its hearing in Mudgee from 15 – 17 February 2023, and are detailed below along with supporting documentation. The most recent expert reports are also attached in full.

These assessments will demonstrate that a lack of technical detail or resolution across key aspects of mine viability, combined with the complex nature and location of the site in close proximity to Lue village and sensitive, economically valuable industries like tourism and agriculture, mean the Bowdens project must be refused.

Importantly, this submission will also alert the Commission to significant gaps and shortcomings in the Bowdens EIS and as a result in the NSW Department of Planning & Environment's assessment of the project.

1. Surface water impacts – Shireen Baguley

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

a) 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.
b) An assessment of the water quality and management of the imported water, including spill/leak management.[1]

Additional issues regarding the SEARS include that:

c) The proposed project's water demand has not been clearly identified.
d) 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.
e) An adequate and secure water supply is not available for the project.
f) 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.
g) The water quality monitoring program is undeveloped and there is no management plan to address spill/leak management.[2]

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

h) It is unclear what the true area of the Mine Site catchment is, which casts uncertainty over the modelled impacts.[3]
i) There is a high level of uncertainty with regards to the AWBM water balance model and its sensitivity to key parameters.[4]
j) The likely impact of the mining operations on the surface water is considered unacceptable.[5]
k) 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). [6]
l) 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.[7]
m) The impact on Groundwater Dependant Ecosystems (GDEs) has not been properly considered.[8]
n) There is simply not the water available to take the quantity required to sustainably operate the proposed mining project.[9]

[1] Baguley, S, Proposed Bowdens Mine SSD 5765 Surface Water Submission Report to the IPC, Feb 2023, Page 8.
[2] Baguley, S, Page 8.
[3] Baguley, S, Page 16.
[4] Baguley, S, Page 26.
[5] Baguley, S, Page 32.
[6] Baguley, S, Page 37.
[7] Baguley, S, Page 43.
[8] Baguley, S, Page 48.
[9] Baguley, S, Page 55.

2. Groundwater impacts – Craig Flavel

a) Modelling of fractured rock has high uncertainty. Layering is not explained, thicknesses are not provided and geometry does not honour geology or faults. [10]
b) These comments align with those made by Middlemis (2022) who made similar observations:
    - *"Figures show considerable layer deviations at the mine site, but there was no commentary provided to justify this representation … the role of the mapped fault structures is not discussed." [11]*
    - *The assertion that the perturbations would be 'of little consequence to predictions' is not objectively justified and is questionable"[12].*
c) Fault behaviour is highly uncertain and may activate during subsidence induced by removal of overburden, blasting or dewatering.[13]
d) Of significant concern is that Bowdens experts note the likelihood of discharge of contaminated water to the south and west of the mine site.[14]
e) Uncertainty around defined groundwater users is influencing risk conceptualisation and conclusions.[15]
f) Significant or unique endemic species in groundwater dependent ecosystems are not presented.[16]
g) There is a lack of hydrogeological investigations between the mine site and bores around Lue, particularly relating to activity-pathway-likelihood-consequence risk assessment.[17]
h) Modelling shows inconsistent groundwater flow direction, with potential contamination of ground and surface water.[18]
i) Lack of clarity around containment of Waste Rock Emplacement and cyanide leachate. [19]
j) Long term / indefinite 'take' from (ground)water resources through evaporation.[20]
k) Insufficient data for a Trigger Action Response Plan or Water Management Plan.[21]

3. Groundwater and aquatic ecology issues – Dr Peter Serov

a) 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.[22]
b) 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.[23]

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[10] Flavel, C, Page 22
[11] Middlemis, Bowdens Silver Project Groundwater Assessment Review, 19th December 2022, page 13, paragraph 2
[12] Middlemis, Bowdens Silver Project Groundwater Assessment Review, 19th December 2022, page 14, paragraph 1
[13] Flavel, C, Page 22
[14] Flavel, C, Page 23
[15] Flavel, C, Bowdens Proposal: Hydrogeology, IPC, 15th February 2023, Page 4
[16] Flavel, C, Page 5
[17] Flavel, C, Page 8
[18] Flavel, C, Page 9
[19] Flavel, C, Page 13
[20] Flavel, C, Page 17
[21] Flavel, C, Page 18
[22] Serov, P, Independent Desktop Review of the Bowdens Silver Pty Limited for the proposed Bowdens Silver Mine: EIS Review Updated, February 2023, Page 1
[23] Serov, P, Page 1

c) 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;
d) There is a high probability of connectivity between the groundwater and surface water resulting in a high probability of impact exchange both between the water sources.[24]
e) There is a lack of definition of what constitutes groundwater and therefore what is a Groundwater Dependent Ecosystem (GDE) and what is not.[25]
f) 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).
g) The predicted drawdown levels of 1-2m at Hawkes Creek would have a significant impact on the baseflow streams and pools present along the watercourse and downstream convergent streams. It is highly likely that the springs, seeps, wetlands, stream, and terrestrial vegetation GDE communities will all be impacted by the predicted conservative drawdown levels.[26]
h) The adjacent springs and other surface wetlands, stream fauna and subterranean ecosystem urgently need to be resurveyed by independent experts who understand these environments and are able identify the fauna species.[27]
i) DPE 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. [28]

4. Acid mine drainage management issues – Michael White

Robust and proven technical solutions to AMD management are not provided. Michael White's findings confirm the major issues documented by the independent review conducted by Earth Systems (2022).

a) Lack of accurate classification of PAF and NAF material which are fundamental building blocks for mine design and volumetric fit.
b) Unproven and substantially problematic design of the Waste Rock Emplacement Area:
    - *"This author has not found any 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".*[29]
    - *"The waste rock dump design is unproven and appears substantially problematic, with initial indications that the site could be establishing the need for water treatment in perpetuity."*[30]
c) Store and release covers proposed for both WRE and TSF are not suitable for AMD control.
    - *"Store-and-release covers are used widely, but almost never in recent years for the purposes of AMD control. The proposed store-and-release cover systems are not*

[24] Serov, P, Page 1
[25] Serov, P, Page 3.
[26] Serov, P, Page 5.
[27] Serov, P, Page 2.
[28] Serov, P, Page 3.
[29] White, A High Level Mining Review of the Bowdens Lead, Zinc, Silver Project, July 2020, Page 6, Paragraph 2
[30] Earth Systems, Update On Independent Review – Acid And Metalliferous Drainage, 23rd November 2022, page 6, table 5

considered an appropriate strategy for PAF waste rock or PAF tailings management.''[31]

d) Unacceptability of a closure strategy for the WRE and TSF that requires water treatment in perpetuity.[32]
   - *"This proposed Project is using predictive modelling and small area field trials to claim its containment designs will manage and prevent AMD impacts on the surrounding environment during the project lifespan and for generations to come. There is no certainty that it will be effective."*[33]
   - *"It remains our advice that the design of these facilities will need to be updated, noting that GCL liners have a limited design life, store-and-release covers are not suitable for AMD control, and the longevity of AMD generation from PAF waste rock is unknown but may continue for hundreds of years.''* [34]

e) Final void water "through flow" risk has not been resolved.
   - *"The open cut pit would be left as a final void with appropriate design to ensure it remains a terminal groundwater sink'' …''If unmitigated, there would be a more than 50% chance that the water level could increase above the level required for the pit to become a throughflow system''.*[35]
   - Proposed Final Void Mitigation strategy of increasing final void footprint by up to 28 hectares has not been assessed in the EIS.
   - A 28ha increase would require moving an additional 16.3 million Bank Cubic Metres of rock, or movement of 50 percent more material for no additional revenue. This work would increase these rehabilitation and closure costs by between 224% and 265%.

a) Major unresolved technical issues dealing with fundamental controls of agreed risks (AMD) do not belong to be solved in Conditions of Consent Management Plans.
b) This project's location is unsuitable as an experimental test site.[36]

5. Lead Dust and Human Health – Professor Mark Taylor

a) 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.[37]
b) 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.[38]
c) Dust will be the key pathway for lead contamination.[39]
d) Pollution will be dispersed under prevailing winds across community and adjacent agricultural producing sites.[40]

[31] Earth Systems, Update On Independent Review – Acid And Metalliferous Drainage, 23rd November 2022, Page 6, Table 5
[32] White, M, Supplementary Submission on SSD-5765 to the IPC, February 2023, Page 1.
[33] White, A High Level Mining Review of the Bowdens Lead, Zinc, Silver Project, July 2020, Page 6, Paragraph 6
[34] Earth Systems, Technical Memorandum - Acid and Metalliferous Drainage, 16th December 2022, page 1, paragraph 4
[35] DPE, Bowdens Silver Assessment Report, December 2022, page 35, paragraph 174
[36] White, M, Supplementary Submission on SSD-5765 to the IPC, February 2023, Page 2.
[37] Taylor, M, Talking points for the Bowden's Mine IPC Hearing, Page 4.
[38] Taylor, M, Page 1.
[39] Taylor, M, Page 1-2.
[40] Taylor, M, Page 1.

e) No mine can demonstrate no off-site impacts. Elevated blood leads exist around mines, even after ceasing operation.[41]
f) Bees and biota mobilise Pb-rich dust, demonstrating that pollution will leave the site and be remobilised into environmental and food systems.[42]
g) 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.[43]

6. Human Health – Professor Barry Noller

a) 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. [44]
b) 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.[45]
c) 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.[46]
d) 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.[47]
e) It remains important to get all residents and particularly children tested for blood lead.[48]
f) 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 particulate matter is ultrafine particles it can be dispersed far more widely than larger size particles in dust deposition.[49]
g) It would be a failure of due process for the IPC to proceed without seeing revised management plans.[50]

7. Social impact assessment and management – Dr Alison Ziller

a) 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.[51]
b) 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.[52]

[41] Taylor, M, Page 1.
[42] Taylor, M, Page 2.
[43] Taylor, M, Page 2.
[44] Noller, B, Statement on Proposed Bowden's silver mine at Lue, February 2023, Page 1.
[45] Noller, B, Page 2.
[46] Noller, B, Page 5.
[47] Noller, B, Page 5.
[48] Noller, B, Page 5.
[49] Noller, B, Page 6
[50] Noller, B, Page 7.
[51] Ziller, A, Submission re. likely social impacts of the proposed Bowdens Silver Mine, Page 10.
[52] Ziller, A, Page 10.

c) 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.[53]
d) 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.[54]

8. Tourism, visitor economy and economic impacts – Karl Flowers

a) 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.
b) 691,000 visitors to the Mudgee region per annum in the four years ending 2019. 826,000 in 2020-21.[55]
c) 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.[56]
d) 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.[57]
e) 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.[58]

9. Property value impact assessment – Peter Druitt

a) 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.[59]
b) In excess of 150 properties in the area, including downstream on Lawson Creek, have potential to be impacted by the project.[60]
c) 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.[61]
d) Bylong Valley Coal Project provides a useful case study of market impact from mining in a rural, greenfield area.[62]

[53] Ziller, A, Page 8 – 9.
[54] Ziller, A, Page 10.
[55] Flowers, K, Mid-Western Regional Council Area Visitation and Economy, 2023, Page 1.
[56] Flowers, Page 1.
[57] Flowers, Page 2.
[58] Flowers, Page 3.
[59] Druitt, P, Property value impact assessment, 2023, Page 1.
[60] Druitt, Page 1.
[61] Druitt, Page 1.
[62] Druitt, Page 2.

e) Negative price impact on property value of between 20 – 30 percent.

As has been demonstrated, the Commission does not have all the information to hand required to accurately evaluate the net benefit or net cost of this project.

To approve the project based on the Proponent's EIS and DPE Assessment Report would be a failure of due process, lowering the standard required to assess the impacts of the project 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.

When the fundamental characteristics of the Bowdens project (being insufficient water, a high proportion of acid forming rock and a high percentage of lead in the ore body) are viewed in the broader context of the location of the site, it is clear this project is incompatible with existing land uses.

Permanent and negative impacts to human health, the environment, the Lue community and the regional agriculture and tourism industries outweigh any positive economic or social impacts created by the project.

This project is not in the public interest. It is contrary to principles of ecologically sustainable development, and specifically to principles of intergenerational equity.

If this project proceeds, the predicted economic benefits might accrue to the present generation, but future generations will bear the long-term environmental, health, heritage and agricultural costs.

This project must be refused.

Regards,

Tom Combes,

President – Lue Action Group