I operate a family farm on the Lawson Creek five kms downstream from the proposed Bowdens Mine. We have a grazing business producing beef cattle for feedlots. My wife's family have farmed this land for five generations. Her family produced fine wool, beef and fat lambs on neighbouring properties, all of which rely on Lawson Creek for their stock and domestic water. This creek is our life blood, in fact, last year during the record breaking drought without the creek we would have had to totally destock.

I am very concerned about the prospect of a mine in our valley. I wish to strongly object to Bowdens Mine.

ACID MINE DRAINAGE AMD

- Acid Mine Drainage (AMD) is only mentioned in the EIS as an issue raised by government and the community. The EIS does not see AMD as an issue at the Bowdens Mine.
- Yet according to the EIS iron sulphide is the most wide-spread sulphide material found at the mine site. Once a sulphide metal deposit is exposed to air (mined) bacteria breaks down the sulphide minerals to sulphuric acid releasing heavy metals in to ground water and streams. This will be highly toxic to aquatic life and animals.
- *Engineers Australia 2019* magazine stated "The United Nations recently labelled AMD as the second biggest problem facing the world after global warming."
- Captains Flat Mine near Canberra, Sunny Corner Mine near Bathurst and Woodlawn Mine near Tarago are all heavy metal mines with a long history (up to 98 years) of heavy metal pollution to streams and ground water. Repeated efforts to rectify the AMD, much of it at government expense the damage is still occurring. This could happen to Lawson Creek.

WASTE ROCK EMPLACEMENT (WEA)

- The EIS assumes that the WEA containing the PAF will not be dangerous to waterways when it leaches. Bowdens state in the EIS that it will only cause the water to be dirty.
- Bowdens will produce 56 million tonnes of acid forming rock and tailings of which 26 million tonnes of rock is Potentially Acid Forming (PAF). This PAF waste rock will be placed in a 77 hectare Waste Rock Emplacement (WEA) where it will remain forever.

TAILINGS STORAGE DAM (TSF)

- Bowdens propose a 177 hectare tailings dam less than one kilometre from Lawson Creek and in its catchment forever. This will remain forever containing crushed ore post mining plus the majority of chemicals added during ore processing – 43,700 tonnes of chemicals including sodium cyanide.
- The engineering design of this dam is detailed and complex and it will be hard to ensure quality in construction. A dam of this design has only ever been trialled in a mine near Mt Isa in Queensland. This trial was for a small dam of 0.7 hectare.
- Newcrest's Cadia Gold Mine near Orange had a breach of the tailings dam wall in 2018 caused by an earth tremor. No tailings escaped the site as a second tailings dam caught the overflow. Lue has experienced tremors so the same could happen here. No second tailings dam is proposed in the EIS.

- Detections of the location of leaks from both the tailings dam and the waste rock emplacement will be difficult to detect and almost impossible to repair.
- Tailings dams do fail, in the past five years more than 20 TSF have failed around the world including the disastrous collapse of a tailings dam at BHP Billiton's coal mine in Brazil resulting massive damage to property and life.

COMPLICATED DESIGN OF CONTAINMENT STRUCTURES AT BOWDENS

- No information provided in EIS as to where the design has been used for an AMD tailings dam in the long or short term
- Construction to achieve design will be challenging, time consuming and expensive. Consistently achieving design will be a big risk

PROJECT ECONOMICS ARE MARGINAL

- Project is sensitive to small adverse movements in silver price
- Assumed silver price is much higher than the silver price at any time during past five years
- There are many risks Bowdens face - complicated design, lack of water, limited operating hours due to closeness to settlement, grade control and metallurgical issues etc
- The project's economic viability calls into question the proponent's ability to guarantee they can afford to rehabilitate the site post mining. Government could be left with that burden

RISK OF LEAD EXPOSURE

- Bowdens will produce 95000 tonnes of lead. This mine is 1.9km from a school and the rest of the 192 residents of Lue. There is no safe level of lead exposure, especially for children. The EIS does not use concentrate or mine ore materials as a source of dust and it doesn't analyse the effect of peak wind events on dust movements. This is not acceptable for the people of Lue.
- Young children are more susceptible and lead poisoning causes growth problems, reproductive issues and a detrimental effect on IQ

CLEAN WATER FOR LUE

- If the mine goes ahead, the people of Lue and its surrounds (some 900 people) will require reticulated water as they will not able to safely drink their tank water.
- We rely on Lawson Creek for all our stock and domestic water. Modelling in the EIS assumes constant and infinite recharge from Lawson Creek to ground water. This is outrageous. For much of the last three years Lawson Creek has just been a series of holes. What is to become of our creek?
- Desk top modelling is used extensively throughout the EIS. Data on flow rates within Lawson Creek have been calculated using the Australian Water Balance Model. I dispute the amount of water estimated in the EIS to flow in Lawson Creek.
- Lawson Creek which flows into the Cudgegong River at Mudgee and then into Burrendong Dam and the Macquarie River is at almost certain threat of AMD.

GROUNDWATER

- Despite the fact that 57% of waste rock is PAF no acid treatment plan is presented
- Leachate dam is located close to Price and Hawkins Creek and in the presence of local geological faults
- There is a high chance the TSF will pollute ground and surface water as
    - Detail on hydrogeology and geology is vague
    - It will be constructed on a fault
    - 1.58ML/day of TSF leakage is planned
    - There is no contingency to remediate leakage
- The EIS fails to detail how leachate will be managed long term
- Little or nothing has been done to investigate other bore users and the impact ming will have on their groundwater supply
- Discrepancies exist relating to the use and containment of cyanide

SURFACE WATER IMPACT

- Section 3.5.1 – Stream flow data from only one of two gauges on Hawkins Creek was used – why?
- Section 3.5.2 – To simulate catchment runoff and stream flow data was used from Cudgegong River at Rylstone – why? Is it similar
- Section 4.4.2 – How will Bowdens manage leachate and PAF during and post closure – not clear in EIS
- Section 4.6.2 – Stronger controls need to in use for determining containment criteria for sediment water
- Section 4.7.9 – The TSF should have a freeboard of 2.9m not the proposed 0.75 metres to be safe
- Table 5.4 – WaterNSW states average regional runoff for the region is 0.7ML/ha/year. In the EIS Bowdens uses a figure of 0.3/ha/year for natural/undisturbed lands. Bowdens is incorrect and doesn't justify the difference.
- Section 5.7 – How is the surplus water storage to be managed? It is not clear in the EIS
- Section 6 – Flood impact analysis is unclear, no detail on who owns the land, what effect it will have on Maloneys Rd creek crossing, unclear as to stabilisation plans considering the mobile local creek systems
- Figure 7.1 – in the final landorm, what are clean water diversion channels? What about potential seepage form the final void and the satellite pits
- Section 7.1 What are the metal concentrations in the final void?
- Figure 8.3 – No discussion of potential impact of the project on dry days in creek systems or impacts on cease to pump triggers
- Section 6.2.5 – What effect will mine have on Lawson Creek crossings?
- Who owns the land impacted by flooding? It is not clear in the EIS
- There are many unanswered questions in the EIS about the effect the project will have on surface water

TRANSFERRING WATER FROM ONE CATCHMENT TO ANOTHER

- There is not enough water in the Lawson Creek valley to operate a mine such as Bowdens so they propose to pump water from the Ulan mines via a 58km pipeline largely through private land.
- There are no commercial agreements in place for guaranteed external supply
- Ulan mines are unlikely to guarantee supply to Bowdens especially during dry times as their water requirements come first
- Any water from these mines will be polluted mine waste water putting at risk the land over which it is piped. What is Bowdens long term plan to manage this pipeline?
- The EIS makes no mention of the difficulty in gaining approval for the pipeline corridor
- Operationally the costs of water treatment and pumping will be considerable
- Water from Ulan mines is from another catchment – this is bad environmental policy to transfer water between catchments
- In the EIS Bowdens state "Considerable reliance would be placed upon water pumped from the external supply during the first two years of operation." This is due to the fact groundwater from the pit would not achieve projected sustained flows until late in the second year of operations.
- What design/operational controls are proposed for the pipeline to protect the environment during construction and operation? It is not stated in the EIS

PRESSURE ON LUE ROAD

- Lue Road will be more dangerous if Bowdens Mine goes ahead
- Lue Road is narrow and winding and already very busy yet Bowdens plan to use this road to transport B Doubles of ore to Mudgee and beyond. Also workers will be travelling along Lue Road twice a day.
- The EIS indicates 256 extra vehicle movements a day plus 4-10 BDouble trucks each carrying 44 tonnes of ore in containers.
- Risk with blasting and in particular transporting explosives have not been addressed in the EIS
- Bowdens propose to truck 5-16 tonnes of explosives and oxidising agents to mine site daily representing 2-4 heavy truck movements. Heaven help us if there's an accident

NOISE

- Current background noise at Lue is extremely low
- Bowdens appears to have underestimated the level of machinery noise
- The EIS does not account for haul road noise near the TSF
- Most monitoring at the site is not recent

ECOLOGY AND BIODIVERSITY

- Assessment of Threatened Swift Parrot was done at the wrong time of year
- Recovery plan for koalas is deficient

- Assessment for frog species was not done in the correct habitat
- Assessment is inadequate of tree hollow survey size, distribution and type
- Inadequate assessment on the effect of background noise and light pollution on nocturnal wildlife
- 33% of mine owned land will suffer a decrease or complete loss of biodiversity
- The EIS fails to thoroughly review the impact on the threatened Grassy Woodland
- Bowdens has not attempted to avoid impacts to threatened species and habitat in the design of their mine
- Their assessment of impacts to stygofauna and the freshwater macroinvertebrate community is incorrect as it does not identify those endemic to the area and dismisses their importance

SOCIAL IMPACT ASSESSMENT

- In the EIS, Unwelt addresses impacts on MWRCLGA rather than the impacts on Lue which is ony two kms from the mine
- Lue's principal concerns arise due to its proximity and the metals to be mine
- Noise, dust and vibration and impacts on water supply will increase the closer you live to the mine
- The toxic nature of lead and its dispersion in air and in the water supply is particularly concerning for those living in Lue – in the EIS toxic risks are assessed as minimal and seriously underestimated
- The mine will have adverse mental and physical impacts on Lue residents so severe that people will want to relocate. Their ability to do so will be undermined by a loss of value in their property.
- A lack of social cohesion is already present in the local community. There is a divide between those whose land has been acquired or who may have done a deal with the proponent should the mine go ahead and those who oppose the mine.
- There are no strategies in place to offset the loss of amenity to the village. Tourism is the second biggest driver in the local economy. With a mine these businesses will fold.
- The negative impacts from this mine will not cease when mining finishes. They will be there forever.
- In the EIS Bowdens offers to double glaze and air condition some houses, spray for dust suppression, limit hours of operation and a few other inadequate measures. Lue residents will be forced to live indoors and will lose their rural way of life - no home grown veges, open windows, clothes drying on the line etc
- Sense of community and pride in community will disappear, people will leave and who will be left to volunteer to fight fires etc.

I am extremely concerned if this mine proceeds as it threatens our community forever. I am most concerned for the future viability of our farm and for the environmental health of the entire Lawson Creek valley.

I strongly oppose this mine.