Issues with the Surface Water Assessment report

The Bowdens surface water assessment data appears to show a monthly average that exceeds 75mm over summer. This is incorrect, as evidenced by the rainfall data from Mudgee (26km west of the mine site) and Rylstone (22km south of the mine site).

Many of the other months are also too high when compared to Mudgee and Rylstone rainfall statistics from BOM.

The number of very low rainfall years that has been experienced in this region is not reflected in the Bowdens surface water assessment annual rainfall data, which has only three years of less than 400mm. This in part seems to be a deliberate attempt to distort the data, as it has excluded 1888 and 2019, both of which are very dry years. Given that the community that will be affected by this mine have recently lived through the crippling drought which culminated in the 2019/2020 black summer fires, this is viewed very poorly.

The surface water assessment reports the average annual rainfall as 673 mm/a. The BOM reports the average annual rainfall for Mudgee as 671 mm/a and 654 mm/a for Rylstone. Given this, the estimate of 673 mm/a is considered unrealistically high. An average annual rainfall of 654 mm/a would be more realistic estimate.

It is also noteworthy that the median for Rylstone and Mudgee is 635 and 656 mm/a respectively, and the 20th percentile is 509mm/a and 494 mm/a respectively. The analysis here shows that one in every five years, the climatic conditions between Rylstone and Mudgee, which covers the proposed mine site, are semi-arid. This means that any loss of available water in these years severely impacts the land, and the people, plants and animals trying to survive on it.

It is probable that the SILO data presented for historical rainfall data has been used in the water balance model. This will overestimate the water available for use across the site, in dust management and processing. It is highly questionable that 740 ML/a of rainfall and runoff would be available as an 'inflow' in a low rainfall scenario.

Given this, there are concerns regarding the validity of the conclusions of the modelling and the assertions that water requirements for the site can be met.

Further, the sensitivity analysis appears to be fundamentally flawed, in that it considers only a 14% reduction in 'rainfall and runoff' to derive the low 'rainfall and runoff' value. It is considered that the reasons for this are that a true assessment of the low rainfall and runoff' would show that there is insufficient water to meet the proposed mine's water demands for an unacceptable duration.

Climate change impacts will increase the number and severity of the dry years experienced in this region.

At one point, the assessment attempts to quantify the loss of water to the downstream catchment, stating there would be an average annual loss of flow of 177 ML/a. This assertion is misleading as it relates only to the estimated flow from within the 'containment system' and overlooks the fact that the water requirements for the whole project are being drawn from within Bowdens land, both that

within the 'containment system' as well as the Bowdens' contiguous land holdings. The mean annual flow is 1,955 ML/a comprised of 965 ML/a surface water and 990 ML/a ground water.

Putting aside the fact that a portion of the groundwater becomes base flow for the creek downstream, and considering only the surface water flows, this would equate to a loss of flow from **10.9% of the Lawsons Creek catchment**. It is an enormous and unsustainable impact on the water resources within this catchment and a significant impact on all land downstream of the proposed mine site.

This flawed presentation of the data also means that the cease-to-flow estimates are also incorrect. These appear to be based on a reduction in flow of 175.2 ML/a, rather than up to 1,955 ML/a. Even before there was a scheme to use all water from the Bowdens' lands for the proposed mine operations, there was a predicted increase in the cease-to-flow frequency during low flows, but this fact is buried in the Environmental Impact Statement. A review of the previous surface water assessment has found that the numbers in the table above are unchanged. It is extraordinary, and simply unbelievable that this has not changed under the revised proposal when such an increase in water use from the site it proposed.

Further, it is not clear where the 'rainfall and runoff' component of the surface water inputs – a significant 917ML/a – is going to come from, given the catchment area of this 'containment system' is only estimated to yield 177 ML/a. This is well short of the required water and its source has not been explained.

It cannot be concluded that the impact of the loss on the availability of water to downstream water users would be negligible. The impact of **any** loss of water in the frequently experienced dry times is critical. Further, it is also expected that in these conditions, one in every five years, that the conditions of the Macquarie Bogan Unregulated and Alluvial Water Sources Water Sharing Plan would be unable to be met.

Groundwater is a valuable resource for lands within the Lawson Creek catchment. The statements above relating to surface water hold true for groundwater and its value in this region. It is not acceptable that such a significant loss will be experienced due to the proposed mine.

In conclusion:

- the surface water assessment has some serious shortcomings, as it does not rely on valid data, has not presented appropriate modelling and contains a number of misleading statements; and
- the proposal to use water sources from within the Bowdens' land holdings to supply the water for the proposed mine is fundamentally flawed. Not only does the analysis within this document demonstrate this finding, but a cursory review of the extreme dry periods experienced by the landholders within the Lue region would show that the water is simply not available. To use what little there is not a viable option and, while the surface water assessment has failed to properly consider a dry year scenario, the fact is mine will not be able to operate in dry periods.
- There are a number of the statements made in the 'Summary of Assessment Outcomes - EIS and Amended Project' in relation to water impacts which are quite simply incorrect.

Water Resources Impact

This mine is simply in the wrong place – there is not sufficient water to sustain it.

Lawson Creek is listed in the NSW Stressed Rivers Assessment in the most stressed category (S1) – with both high environmental stress and a high extraction rate

It is more often than not a series of water holes with no visible flow during summer

The mine would use up to 965 ML/a of surface water, which is a loss of flow of nearly 11% of the Lawsons Creek catchment. Losing this much water from the upper catchment would impact everyone of the mine downstream. Bowdens are Double-counting the harvestable water

There will be an increase in the frequency with which Lawsons Creek ceases to flow.

Dewatering or draining water from the catchment's groundwater reserves, commences during site establishment with an average extraction rate of approximately 1 ML/day with pit inflows peaking at approximately 2.5 ML/day. The peak total annual dewatering requirement is during Year 4 with a predicted annual volume of approximately 1 222 ML. The losses will continue after the mine closes. This is too much to lose.

Groundwater drawdown has the potential to reduce streamflow through either direct stream depletion or through intercepting groundwater that would otherwise discharge to surface water.

For Hawkins Creek, the included reach extended upstream from the confluence with Lawsons Creek to approximately 6 km northeast of the Mine Site, in the upper catchments of the Reedy Creek and Horse Gully tributaries (Jacobs, 2022). The Lawsons Creek reach extended from approximately 3.5 km southeast of the Mine Site to 4 km west of the Mine Site.

At the end of mining, propagation of drawdown, as represented by the predicted 1 m drawdown contour, is typically of the order of 1.7 km to the east and south, and 2.6 km to the west and north of the open cut pit.

Therefore, the final void is predicted to remain a terminal groundwater sink under both assessed scenarios. Groundwater take would occur in perpetuity as groundwater inflow to the pit lake would continue to occur to replace evaporative losses from the main pit lake.

The salinity of the pit lake would gradually increase due to evaporative concentration. Being a terminal groundwater sink, the resulting saline water would remain captured within the final void.

Bowdens intent is to apply water licenses purchased from other catchments and further downstream in the Macquarie catchment to the Lawson valley - which is of course at the very top of the Macquarie catchment. To state the obvious, the purchase of water licenses from elsewhere is not the purchase of water from those areas. The water must be found locally and it is questionable at best to believe it is possible to pull that much water out of the upper catchment of the Lawson Creek.

Further, the ground and surface water systems are highly connected within the area. There are many springs that are the lifeblood for many humans, plants and animals in the area. A significant

number of bores do not function in Lue village in dry times now – this is indicative of how impractical it is to believe that Bowdens can find sufficient water locally to run the mine not to mention what are the consequences for all those surrounding the mine when their water supplies further dry up. The groundwater here also provides the baseflows further downstream. It can only further stress the waterways and disadvantage all who rely on that water.

It is plain wrong, not feasible and certainly unsustainable for Bowdens to propose to extract all the water it needs from the lands it owns, regardless of if it's from a surface or groundwater source.

Water Quality

The risk to water quality is unacceptable due to the technologies proposed as part of the processing as well as the location of a very large tailings dam on the river system in perpetuity. There are multiple potential sources of contamination, through the risk of acid forming material leaching out of containment areas, being inadvertently placed in incorrect locations or any breach of the tailings dam. Failure of the dam wall would have catastrophic consequences for the community. This gives rise to the risk of contamination from this mine that may have irreversible impacts on the community's health, agricultural production and natural resources

The proposal does not adequately address the multiple sources of contamination and if it happens, it is too late to rectify. The risk of contamination remains unacceptably high and the proposal should not be approved.

Health

This mine is in close proximity to Lue village and the local school, and with other nearby settlements including Mudgee and Rylstone. The mine will emit dust blown particles which will carry lead, cadmium and cyanide and will be dangerous to health.

Recovering more water from the tailings dam for mining operations means the tailings dam water level will be lower, exposing the toxic soil to wind events and spreading the lead/cadmium/cyanide further.

A water-challenged mine will be less able to spray the roads and undertake dust-mitigation activities, causing more dust movement - this will especially be the case during dry times and droughts when dust is at its worst

Bowdens attempt to ‘get by’ with no external water supply will increase the health impacts on the local community.

Visual impact

The Amendment proposes the re-alignment of the Transgrid 500kV transmission line. The proposed re-aligned transmission line would be an easement 70 metres wide and 3.5 kms long requiring clearing and roadworks. These towers are west of the existing line and 500 metres closer to the village. The route is on a ridge line with elevations of up to 725 metre thus highly visible, and the towers will be visible from Lue Road, many local properties and the village.

The visual impact of this proposal within the rural landscape is highly significant and considered not acceptable.

Economic viability

The village of Lue represents a vibrant community and is a popular stop on the tourism trail connecting the towns of Mudgee, Rylstone and Kandos. The proposed mine is at odds with this, and threatens to adversely impact the future viability of the Lue village and the local primary school. There will be unacceptable impacts on noise, air, water and visual amenity. This will contribute to a decline in liveability for the local community, leading to irreversible economic and social consequences for the Lue village and the wider Region.

Merit

There are clear questions of the viability of this mine, and it is clear it will have a significant impact on the neighbouring lands, people, plants and animals. The mine is short term – 15 years, while the impact will continue in perpetuity. This is not acceptable.

This project is not stated by Bowdens as an "environmentally and socially sound project". This is because it is not and should not proceed.