17 July 2020

WM Project Number: 20240
Our Ref: [Click here to insert]
Email: phil.english@gmail.com

Phil English
Lue Action Group

Dear Phil

Re: Bowdens Silver Pty Ltd Lead, Zinc, Silver Project - Review of Noise and Vibration Assessment

1.0 INTRODUCTION

Wilkinson Murray Pty Ltd (WM) has been retained by the Lue Action Group to undertake a review of the noise and vibration assessment for the proposed Bowdens Silver Project.

Bowdens Silver Pty Ltd (Bowdens Silver) propose to construct and operate an open cut mine to recover mineralised rock (ore) containing silver and a small percentage of zinc and lead in depths of approximately 180m. The Mine Site is located approximately 2km northeast of Lue in the Mid-Western Regional Local Government Area. The Project would comprise a main open cut pit and two small satellite pits, processing plant, waste rock emplacement (WRE), tailings storage facility (TSF), as well as ancillary components and associated infrastructure that would extract and process approximately 2 million tonnes of ore per year over a period of approximately 15 years. A total of 46.4 million tonnes of waste rock over 16 years would be excavated. Bowdens Silver submitted a development application and Environment Impact Statement (EIS) in May 2020.

This assessment is a review of the following documents:

- SLR Consulting Australia Pty Ltd – Part 1 Noise and Vibration Assessment prepared by SLR Consulting Australia Pty Ltd (referred to as the Assessment).
- Secretary's Environmental Assessment Requirements (SEARS) – Application Number SSD 5765, date of issue June 2019.

The SEARs on the topic of noise is presented below:

Noise and Blasting – including:

- an assessment of the likely operational noise impacts of the development (including construction noise) under the Noise Policy for Industry (EPA), and the Voluntary Land Acquisition and Mitigation Policy, and having regard to the EPA's requirements (see Attachment 2A and 2B);
- if a claim is made for specific construction noise criteria for certain activities, then this claim must be justified and accompanied by an assessment of the likely construction noise impacts of these activities under the Interim Construction Noise Guideline;

- an assessment of the likely road noise impacts of the development under the NSW Road Noise Policy; and
- an assessment of the likely blasting impacts of the development on people, animals, buildings and infrastructure, and significant natural features, having regard to the relevant ANZECC guidelines;

It is interesting to note that noise is included in the Human Health Risk Assessment. The SEARs require:

Human Health – including:

- a Human Health Risk Assessment addressing how the development's environmental impacts in relation to air quality (including heavy metals) and noise may impact on the health of the local community; and
- monitoring and management measures to reduce risk to human health;

2.0 WILKINSON MURRAY OVERVIEW

Wilkinson Murray is a specialist acoustic firm providing consulting services noise and vibration consulting since the 1970s. Wilkinson Murray has offices in the Sydney, Wollongong, Newcastle and Hong Kong. Wilkinson Murray has over 30 technical staff. Our strength lies in our people, many of whom are leaders in their specialist fields. Wilkinson Murray is a member of the Association of Australasian Acoustical Consultants (AAAC).

Wilkinson Murray has significant experience in environmental, mining and industrial noise and vibration assessments. Wilkinson Murray has the expertise to assess the impact of noise and vibration for all industrial applications including:

- Mining;
- Oil and Gas Exploration;
- Manufacturing;
- Construction;
- Energy and Renewable energy sector;
- Transport.

John Wassermann who is a Director of Wilkinson Murray conducted the review of the Bowdens Silver Project.

John is a Mechanical Engineer with over 30 years' experience in the public and private sectors. John is a member of the Australian Acoustical Society (MAAS) and Member, Institution of Engineers Australia. John worked in the NSW State Government, initially as the Manager of the Noise Assessments area for the EPA, and subsequently as Manager Transport for the Major Infrastructure Assessment area of the Department of Planning. He has been at Wilkinson Murray since 2004. John has considerable experience in NSW environmental, noise and air quality legislation, Environment Planning and Assessment Act (1979) and the POEO Act (1997). While working as a consultant he has been involved in many noise mining projects around the world.

3.0 REVIEW

3.1 Policies and Guidelines used in the Assessment

The SLR assessment considered the following noise and blasting policies and guidelines:

- NSW Noise Policy for Industry;
- Interim Construction Noise Guideline;
- NSW Road Noise Policy
- Assessing Vibration: A Technical Guideline;
- Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration (ANZECC); and
- Voluntary Land Acquisition and Mitigation Policy.

Wilkinson Murray considers that the Assessment considered the appropriate policies and/or guidelines particularly the NSW EPA's Noise Policy for Industry as well as the Department of Planning's Voluntary Land Acquisition and Mitigation Policy.

3.2 Background Noise / Noise Criteria

Background noise levels are not contemporary, most of the monitoring was conducted in 2011, 2012 and 2013 although more recent data is also included from 2017. The monitoring indicates very low background levels in the order of 25 dBA.

The Assessment uses NPfI minimum threshold background noise levels of 35 dBA day and 30dBA evening and night to establish noise criteria.

The Assessment uses the minimum recommended operational intrusive noise criteria recommended by EPA of:

- 40 dBA $L_{Aeq,15min;}$
- 35 dBA $L_{Aeq,15min}$; and
- 35 dBA $L_{Aeq,15min}$.

Wilkinson Murray considers these noise criteria to be appropriate for the area and the project. Additional noise monitoring will not reduce the noise criteria as they are the lowest possible as recommended by the NPfI.

3.3 Methodology

SLRs noise assessment considered noise impacts from the Project during initial construction and operations. The noise assessment has utilised the ENM (Environmental Noise Model) that provides predictions of noise impacts at each modelled receptor as an outdoor noise level for a range of meteorological conditions.

The assessment of noise impacts has addressed four noise scenarios:

- **Scenario 1** (Year 0) when only day-time operations occur that involve site development and construction;

- **Scenario 2** (Year 3) when there are day, evening and night-time operations and construction of the second raise of the TSF embankment;
- **Scenario 3** (Year 8) when there are day, evening and night-time operations and construction of the third raise of the TSF embankment; and
- **Scenario 4** (Year 10) when there are day, evening and night-time operations without any construction works for the TSF embankment.

Wilkinson Murray has reviewed the general noise modelling methodology and assessment and has the following comments:

- Wilkinson Murray considers that the noise modelling scenarios are representative of the life of the mine.
- Wilkinson Murray considers that the ENM noise model is the most appropriate noise model to be used for the project and is considered best practice.
- The Assessment considered both standard meteorological conditions as well as worst-case meteorological conditions for the noise predictions this is consistent with the NPfI.
- The assessment used construction noise criteria. Typically, this is not done unless the construction phase is completely separate from operations. The first 6months has been identified as construction and is limited to daytime operation. Once ore is mined, SLR appear to assess all noise as operational. Wilkinson Murray considers this approach to be reasonable.
- The assessment appears to respond to all the SEARs requirements.
- The traffic noise assessment is considered to have been completed in accordance with industry standards.
- The blasting noise assessment is considered to have been completed in accordance with industry standards.
- All sound power levels adopted for the noise predictions appear to be very low when compared to representative plant types from other mines (eg D11 dozer 113dBA in first gear).
- Sound power levels for plant have not been justified through reference documents as required by the NPfI (Section 3.3). **Sound power level references should be provided by the proponent.**
- As a noise control, the assessment indicates that all dozer operating outside the pit would be in 1st gear with a low sound power level of 113dBA. **The practicality of this assumption should be verified.**
- The Assessment does not provide sound power levels for the normal operation of the D11 inside the pit. **The assumed sound power level for the normal operation of a D11 dozer should be provided.**
- The assessment does not provide noise spectra for the sound power levels and the source heights. **The sound power level spectra should be provided with the source heights to ensure noise predictions are accurate.**
- The assessment identifies low frequency noise as not being an issue. This may be the case however the assessment does not provide noise spectra that were used for the assessment and therefore can not be verified.

- There appears to be no haul road noise sources to the TSF emplacement area. **All noise sources should be reviewed in the model to ensure they have been included.**

3.4 Risk Assessment

As there is no justification through refence documentation that the assumed low sound power levels can be achieved and appropriate modelling assumptions used (spectra, source heights, operational assumptions that dozers can only operate in 1st gear outside the pit) there is a risk that the predictions are not as accurate as they could be and possibly under state the noise impact.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully
WILKINSON MURRAY

John Wassermann
Director