Silver City Energy Storage System Submission

16 October 2023

Via NSW Portal

The Minister for Planning
Department of Planning and Environment

Dear Minister

Submission regarding Hydrostor's proposed Silver City Energy Storage System
Application: SSD-47065463
Proponent: A-CAES NSW Pty Ltd

We refer to the development application SSD-47065463 for the Silver City Energy Storage System, which seeks development consent to operate an energy facility (**Proposed Project**) at the Potosi Mine approximately 3km northeast of Broken Hill, NSW (**Site**). The Proposed Project is a State Significant Development within the meaning of section 4.36(1) of the *Environmental Planning and Assessment Act 1979* (**EPA Act**) and therefore requires development consent before it can proceed.

The purpose of this letter is to outline our objections to the Proposed Project.

1. Structure of this Submission

1.1 This Submission is structured as follows:

1.1.1 **Schedule 1** contains our detailed Submission;

1.1.2 **Schedule 2** is withheld from this public Submission, and will be provided directly to the Department by email: it will contain confidential business information; and

1.1.3 **Schedule 3** is also withheld from this public Submission, and will be provided directly to the Department by email: it will contain a list of regulatory concerns which have not been addressed or adequately considered in the publicly available documents relating to the EIS or the Proposed Project generally.

2. We object to the Proposed Project

2.1 This Submission details the reasons we object to the Proposed Project, which will be located adjacent to our property. Our property which is our primary place of residence, and the site for our operating business, Outback Astronomy.

3. Questions

3.1 Should you have any questions in relation to our Submission, please direct them to us using the details below:

Yours sincerely

Linda & Travis Nadge
C/- Maddocks Lawyers
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Schedule 1 – Detailed Submission

1. Background

1.1 We are the registered holders of a perpetual lease of Lot 2603 on Deposited Plan 76463, Lot 4972 on Deposited Plan 45035 and Lot 70 on Deposited Plan 769280, otherwise known as 18817 Barrier Highway Broken Hill, NSW 2880, which is located 1.13km from the Site (**our Property**).

1.2 We own and operate an outdoor stargazing and hospitality business, Outback Astronomy, from our Property, which attracts tourists from all over Australia (**Business**).

1.3 Our Business is entirely dependent on dark skies and inky black conditions. We cannot operate our Business in certain weather conditions (for example, during overcast conditions, or during a full moon phase), or in circumstances where there is light disturbance to the sky.

1.4 In or around April 2022, we were notified of the Proposed Project during a community meeting. Further information was provided shortly after at a 'Hydrostor Community Forum'. At this time, and in all correspondence since, we have raised our concerns with the Proposed Project, in particular in relation to:

1.4.1 the impact of the Proposed Project on our Business; and

1.4.2 the impact of the Proposed Project on the surrounding area and the use and enjoyment of our Property.

1.5 Those impacts have not been adequately addressed in the environmental impact statement released on 19 September 2023 (**EIS**).

2. Summary of Objections

2.1 We have extensive objections to the Proposed Project and have summarised those objections below:

2.1.1 The location of the Proposed Project appears to have been incorrectly identified in the EIS. This is addressed in our detailed submission below at paragraph 4.

2.1.2 There will be unacceptable impacts on the environment as a result of light, noise (including blasting during construction) and dust pollution. These factors are exacerbated by the fact that:

(a) the construction phase of the Proposed Project is expected to last 36 months; and

(b) the operational phase of the Proposed Project will continue for a period of 50 years.

This is addressed in our detailed submission below at paragraph 5.

2.1.3 The Proposed Project will prevent the operation of our Business and will destroy the use and enjoyment of our Property.

2.1.4 As a result of our Business being closed, the Proposed Project will also have detrimental social and economic implications for the broader community. This is addressed in our detailed submission below at paragraph 6.

2.1.5 The EIS does not provide adequate information in relation to key issues such as:

(a) the impact and use of lighting at night during both the construction and operational phases;

(b) where the accommodation for the project workers will be located, and the light and noise impacts of that site (and any relevant construction at that site); and

(c) the nature of the commercial relationship between Perilya Broken Hill Limited (**Perilya**) and the Proponent and the impact that will have on the Proposed Project.

This is addressed in our detailed submission below at paragraph 8.

2.2 On the basis of these objections, as outlined in more detail below, it is our position that the Proposed Project and development application should be refused.

3. Relevant considerations

3.1.1 In making its determination, the Minister must consider:[1]

(a) the relevant environment planning instruments;

(b) the likely impacts of the Proposed Project, including the environmental impacts on both the natural and built environments and the social and economic impact in the locality;

(c) the suitability of the site for development;

(d) any submissions made in accordance with the EPA Act; and

(e) the public interest.

3.1.2 We have set out our detailed response to these considerations below.

4. Location

4.1 The EIS states that the Proposed Project will be co-located on the Potosi Mine site which is comprised of a combination of Crown land leased by, and (as we understand it to some extent) freehold land owned by, Perilya.

4.2 However, according to Figure 1.4 of the EIS, the majority of the Proposed Project will be located on the Flying Doctor Deposit.

4.3 Our review of the EIS material and additional data analysis indicates that:

4.3.1 65% of the Proposed Project's surface footprint (excluding the powerline corridor) will be located within the Flying Doctor Deposit mining boundary; and

4.3.2 95% of the physical facility (i.e. the built structures) will be located inside the boundary of the Flying Doctor Deposit mining boundary.

4.4 The Proponent's failure to accurately identify the correct location of the Proposed Project is a fundamental misrepresentation – particularly when the EIS goes to such fundamental issues as the impact of the Proposed Project on our Property, in particular the impact of noise, dust and light pollution. The EIS contains an abundance of information in relation to the impact of the Proposed Project on the Potosi Mine however, the Proposed Project has not adequately

[1] S 4.15 EPA Act.

considered the interaction of the Proposed Project with (and its environmental impact on) current and future plans of Perilya for the Flying Doctor Deposit.

4.5 The Proponent must therefore prepare:

4.5.1 a new EIS which correctly identifies the location of the Proposed Project, and the impact of the Proposed Project on all surrounding areas; and

4.5.2 new assessments which appropriately consider the cumulative impact of the activities anticipated in relation to the Proposed Project alongside those of the possible activities associated with the Flying Doctor Deposit,

before any further action is taken.

4.6 That EIS ought to be re-submitted by the Proponent, and then made available for public submissions.

5. Environmental impacts

5.1 Light pollution

5.1.1 The light pollution generated as a result of the Proposed Project, is a significant concern to our environmental surroundings, the operation of our Business and enjoyment of our Property.

5.1.2 The EIS states that:

(a) during the construction phase:

(i) lighting will be required[2];

(ii) construction of the underground cavern will be undertaken at night[3]; and

(iii) construction of the surface infrastructure associated with the Proposed Project will be undertaken during daytime construction hours only, therefore night lighting requirements during construction will be limited[4]; and

(b) during the operational phase:

(i) the operational and security lighting required, will be minimal low-level lighting[5]; and

(ii) the detailed design process for lighting will be undertaken in accordance with AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting requirements[6].

5.1.3 Importantly, the EIS **does not** provide:

(a) an assessment of the light disturbance conducted at night; or

[2] Page 179 of the EIS.
[3] Page 184 of the EIS.
[4] Ibid.
[5] Page 17 of the EIS.
[6] Page 198 of the EIS.

(b) information in relation to the impact of vehicle lighting at night, during both the construction and operational phase of the Proposed Project.

5.1.4 The introduction of lighting, in particular the use of night lighting, is a significant concern for us. Whilst the visual impact may be low during the day, the EIS fails to adequately analyse the visual impact of the Proposed Project and use of light at night.

5.1.5 From our understanding of the EIS, and our lived experience, light will be consistently utilised at night for the entirety of the Proposed Project. This light disturbance will:

(a) prevent our Business from operating in the manner which is currently possible given our current dark-sky environment; and

(b) prevent our own use and enjoyment of our land, its aspect and views,

for the duration of the Proposed Project.

5.1.6 In relation to the mitigation and management of light pollution, the EIS states that:

(a) during the construction phase:

(i) any mobile or temporary lighting required during the construction phase will be managed to reduce any potential offsite impacts. Management will include restricted lighting only within areas requiring lighting, use of directional lighting away from the adjoining residential properties and use of shielding including physical shielding and use of any vegetation and topography (if possible)[7]; and

(ii) temporary disturbance required during construction will be rehabilitated as soon as practicable following the completion of construction[8]; and

(b) during the operational phase:

(i) all new fixed lighting associated with the Proposed Project (operational lighting and security lighting) will be installed and maintained in accordance with the Australian Standard AS4282 – 1995 – Control of Obtrusive Effects of Outdoor Lighting[9]; and

(ii) the Proponent will consult with Outback Astronomy during the development of the detailed design to address any specific lighting requirements relating to this business[10].

5.1.7 In response to the mitigating factors outlined above, we note that:

(a) our Business requires a dark, black sky in order to operate. If these conditions cannot be achieved, our Sky Show is materially and adversely affected. As such, any light pollution within 1.13km of our Property, regardless of how it is directed, managed or restricted, will have a detrimental impact on our Business;

[7] Page 198 of the EIS.
[8] Ibid.
[9] Ibid.
[10] Ibid.

(b) the permanent glow and glare from the Proposed Project will prevent us from enjoying the outback sky and the proper use of our Property, to which we are entitled;

(c) the notion of using vegetation as an appropriate barrier is absurd. We live in a hot, dry climate and with the declaration of El Niño in Australia, the upkeep and maintenance of this proposal is completely unrealistic. Further, in addition to taking time to grow, light can escape vegetation via glare and glow: you can also see from Figure 1.2 below how little impact vegetation on the Site will have in preventing light escaping the Site;

(d) the EIS does not provide detail in relation to the rehabilitative measures which will be offered as a result of the Proposed Project. Nevertheless, we fail to see how our Business and our Property will be adequately compensated for the loss suffered;

(e) the statements referred to in paragraphs 5.1.2(b) and 5.1.6(b)(i), refer to compliance with the Australian Standard 4282 (INT) 1995. This Standard was superseded by AS/NZS 4282: 2019 Control of Obtrusive Effects of Outdoor Lighting. The Proponent's failure to identify the correct Standard, provides little comfort that:

(i) the essential lighting requirements will be properly considered; and

(ii) assertions or undertakings by the Proponent about its proposed, and future, compliance with environmental standards are reliably made or can be relied upon, given its abject failure to apply the correct standards in developing its EIS; and

(f) the practical reality of the Proposed Project, is that there will be light disturbance regardless of any mitigating factors. Such disturbance will not be adequately monitored or managed and, given the impact on our Business and our Property, we will be left to suffer the consequences.

Our experience

5.1.8 In an attempt to provide further context, we have set out below the conditions which are ordinarily required for our Business to operate and the impact light disturbances have had on our Business in the past.

5.1.9 During the darkest lunar phase, the sky is so dark that you cannot see your hand when it is held in front of your face. We refer to Figure 1.1 which illustrates the darkness of the sky when there are no light disturbances.

Figure 1.1 – Evidence of darkness ordinarily required

Example 1

5.1.10 In September 2019, Perilya had drilling contractors attend to work during the middle of our night Sky Show. Despite the work site location being nearly a kilometre away, the light disturbance completely disrupted our show and a dark sky could not be achieved (see Figure 1.2 below). In the absence of sufficient evidence suggesting otherwise, this is what we expect to see from the Proposed Project, which, is completely unacceptable.

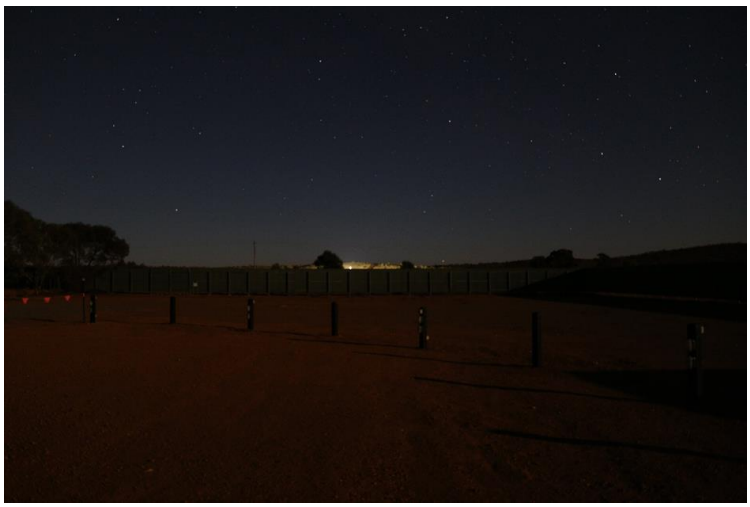

Figure 1.2 – Evidence of light disturbance from Perilya on 18 September 2019.

Example 2

5.1.11 From 15-16 September 2023, the Silver City Show, created a light disturbance, illuminating the sky. The showground is approximately, 15km away from our Property, yet still managed to have a significant impact on our Business.

5.1.12 The inclusion of light at night, in any form, within such a close proximity to our Property, will have a significant impact on the use of our Property and is entirely incompatible with the approved and existing operation of our Business. It will destroy our key marketing and promotional messages in every form that we have relied on to date.

5.1.13 We do not accept the Proponent's assertion that it will continue to engage with us during the design stage to ensure that lighting design and management are suitable. We have been communicating our concerns to the Proponent since April 2022. To date, our concerns have been ignored and the Proponent has failed to engage with us on these issues in a constructive manner.

5.2 Noise and vibration

5.2.1 There will be significant and unacceptable implications suffered as a result of the noise and vibration associated with the Proposed Project.

5.2.2 The Noise and Vibration Assessment (**NVIA**) prepared by the Proponent, included at Appendix 9 of the EIS, states that:

(a) Our Property currently has a rating background level (**RBL**) of:

(i) 41dB(A) during the day;

(ii) 25dB(A) during the evening; and

(iii) 17dB(A) during the night.

(b) The Proposed Project will have a Project Noise Trigger Level (**PNTL**) of:

(i) 46dB(A) during the day;

(ii) 35dB(A) during the evening; and

(iii) 35dB(A) during the night.

5.2.3 While the evening and night time noise ***goal*** for the Proposed Project of 35dB(A) is consistent with the strictest application of the EPA Noise Policy for Industry, this is an estimate only. The noise levels of the Proposed Project may, in practice, be greater than what has been predicted, and therefore exceed the EPA Noise Policy for Industry threshold.

5.2.4 Notwithstanding this, our Property will still be subjected to increased noise levels of 10dB(A) above current levels in the evening and 18dB(A) above current levels at night.

5.2.5 These increases will have a direct impact on our Business, our Sky Shows and our guests, and our enjoyment of our Property. The Proposed Project is therefore entirely incompatible with the existing use of our Property and our Business.

5.2.6 The EIS has failed to consider:

(a) If the Proponent will have noise measurement mechanisms in place for the duration of the Proposed Project, noting that at (top of) page 117 of the EIS the Proponent:

(i) states that PNTLs will not vary over the life of the Proposed Project's operation; and

(ii) relies on this bald assertion to justify the Proponent's absence of any ongoing monitoring of noise compliance, which in this case is an approach which is totally unacceptable; and

(b) what further actions will be taken by the Proponent if the PNTL levels are in fact exceeded (it being unlikely that the Proponent will, in any event, uncover such non-compliance given the absence of on-going monitoring).

5.2.7 We also have concerns regarding the accuracy of the information included in the NVIA particularly given that certain details relevant to the acoustic assessment (such as noise emanating through the enclosure walls and out of ventilation and duct openings) are not included in the NVIA.[11] Such omissions cause us to question the integrity and the calculations of the NVIA (and their rationale for no future monitoring).

5.2.8 In light of these concerns, we have engaged an independent noise expert, Stephen Gauld of Day Design Pty Ltd, Consulting Acoustic Engineers, to provide a report based on the information contained in the EIS (a copy of the report is attached as Attachment 1). By way of summary the report concludes that:

(a) the noise emission (of up to 35 dBA) will be clearly audible during the night and will dominate the acoustic environment. It will create an unacceptable noise impact at 18817 Barrier Highway, Broken Hill for occupants and visitors to Outback Astronomy;

[11] Refer to the Noise report at Attachment 2.

(b) in the case of *Rocky Hill Mine in Gloucester Resources Limited v Minister for Planning* (2019) NSWLEC 7, the court concluded that the **additional emergence of the mine noise level in areas where the background noise level was less than 30 dBA**, would cause the noise emission from the mine to be more noticeable and would be more likely to affect the residents' acoustic amenity;

(c) the background noise levels in the Gloucester Resources Limited matter were as low as 24 dBA. In this case, in Broken Hill, the background noise levels are significantly lower at night, being 17 dBA, which will exacerbate the noise impact further than in the Rocky Hill Mine matter, if the noise criterion recommended in the NIA were applied at night; and

(d) in this case, it is to be expected that the noise impact would cause significant detriment to the operation of Outback Astronomy as the quiet background nature of the property is a desirable feature for the nocturnal business, which would be eroded if the proposal were approved.

5.2.9 The Proponent also paid for a report to be provided by Thomas Taylor of Renzo Tonin & Associates in an effort to assist with our concerns. In line with the conclusions above, this report also concludes that the NVIA is incomplete, omits fundamental information and recommends that the Proponent provide additional information. A copy of this report is attached as Attachment 2.

5.3 Air quality

5.3.1 Dust emissions from the Proposed Project are also a primary concern to the surrounding area, our Business and our Property. Such emissions could lead to increased lead exposure within the Broken Hill area.

5.3.2 The EIS contains an Air Quality Impact Assessment (**AQIA**) prepared by Airen. The AQIA identified that:

(a) the construction phase of the Proposed Project, is likely to result in some dust generation. These emissions will include dust from excavation works, material handling, material transport and wind erosion from exposed areas; and

(b) mitigation measures need to be implemented, including but not limited to:

(i) watering of haul routes;

(ii) minimising vehicle speed on unsealed roads;

(iii) minimising the area of disturbed land;

(iv) water sprays on stockpile areas.[12]

5.3.3 The EIS fails to address just how significant the management of dust is. With dry, hot conditions expected for 2023/2024 (and into the future with the re-emergence of El Niño), frequently watering stockpiles and haul routes will not be sufficient to manage the dust emissions.

5.3.4 Watering must be conducted on a full time basis to effectively manage the risk. This includes consistently watering overnight. Furthermore, additional measures must also be enforced on days where there are strong winds, or the weather is particularly hot. These measures:

[12] Page 121 of the EIS.

(a) must be robust; and

(b) frequently assessed and managed throughout the duration of the Proposed Project,

to minimise the adverse implications as a result of the Proposed Project.

5.3.5 The EIS does not indicate whether:

(a) testing for lead and other contaminants will be conducted on the overburden or mined material;

(b) how the overburden or mined material will be supressed on a permanent basis; or

(c) what measures will be adopted if contaminants (lead, silver, zinc), or economic quantities of ore, are found within the extracted material.

We also do not understand the Proponent's assertions that it is 'extremely unlikely' that economic quantities of minerals will be extracted when accessing and mining the Proposed Project's cavern, given the obvious overlap between the site, access points and underground location of the Proposed Project, and its overlap with the Flying Doctor resource.

5.3.6 In the absence of this information, and with high volumes of material being extracted (378,000 cubic metres of rock – EIS pages 47 and 208), we have serious concerns that, in practice, the stockpiles and site uses (which are not fully explained):

(a) may contain hazardous materials and dangerous levels of lead; and

(b) may, in light of the Proponent's complacency on these matters, not be managed correctly.

5.3.7 In light of this, we would be extremely concerned about the impact of these emissions on our visitors, and in particular vulnerable persons such as young children or pregnant women, when visiting our Property, particularly given the highest dust emissions will be generated from the site located 1.13km from our Property.[13]

5.3.8 We would also be extremely concerned with the likely reputational damage if there was any hazardous materials found on our site caused by these dust emissions.

5.3.9 The increase in dust emissions will also cause our doors and windows to be closed at all times. We expect that our amenity costs (i.e. air conditioning) will increase as a result of the dust generated from the Proposed Project. The enjoyment of our outdoor environment will also be significantly impacted.

5.3.10 The mitigation measures proposed in the EIS, such as managing the amount of traffic and proposing that project personnel car-pool to the Site, are entirely inadequate: the EIS does not indicate how such actions will be managed or controlled if these measures are not followed by the relevant personnel.

6. Social and economic impact

[13] Page 118 of the EIS.

6.1 Our Business is an award-winning astronomy experience, attracting tourism and generating revenue, for the Broken Hill region.

6.2 Guests are treated to a personalised night sky show, highlighting panoramic sky views of the Milky Way Galaxy with real time commentary provided by an experienced guide. Subject to the conditions, pre-tour catering commences from 4pm and tours operate from 6pm during the winter months and from 9pm during the summer months. The dark sky and quiet surrounds are central to the operation and success of our Business.

6.3 Each year, thousands of guests visit our Property to experience our Sky Shows and hospitality. Those guests also contribute to the tourism sector and economic growth of the local community.

6.4 If our Business is forced to close as a result of the Proposed Project, accommodation, hospitality and other tourism providers within our region will also experience the economic implications. Accordingly, the impact of the Proposed Project must not only be considered in the context of our Business but also in the context of the community more broadly.

6.5 Please refer to Schedule 2 which provides further information in relation to our Business.

7. Nuisance

7.1 Notwithstanding the above and the impact the Proposed Project will have on our Business, our Property is also our home. It is our primary place of residence which we have enjoyed for more than 8 years.

7.2 Our Property is located within a C4 environmental living zone, and we are entitled to the benefit of special ecological, scientific and aesthetic values.

7.3 The Proposed Project threatens to burden our sanctuary with (amongst other things):

7.3.1 24-hour noise and vibration;

7.3.2 increased levels of dust emissions; and

7.3.3 permanently lit skies,

for the duration of the Proposed Project.

7.4 As a result, we will be expected to live with our doors and windows closed in an effort to mitigate the disturbances and the overall liveability of our Property will see a rapid decline.

7.5 These factors are not insignificant and will be intolerable to withstand, particularly given the length of the project.

7.6 If the Proposed Project proceeds, we will have strong grounds for a nuisance claim as a result of the adverse implications which have not been properly addressed or managed by the Proponent.

8. Inadequate information

8.1 Operational night lighting

8.1.1 As noted above in paragraph 5.1.3, the EIS does not consider the impact of night lighting during the construction and operational phases of the Proposed Project.

8.1.2 This is a significant omission, given the detrimental impact that the use of night lighting will have on our Business and our Property.

8.1.3 The use of operational night lighting must be properly considered, in the context of our business and not the ordinary standards, before any further action is taken.

8.2 Accommodation of workers

8.2.1 While we can appreciate the positive impacts of accommodating new workers in our town, the EIS has failed to provide critical information in relation to workforce accommodation.

8.2.2 The EIS states that:

(a) the construction phase of the Project is expected to require 780 full time equivalent (**FTE**) over three years or an average of 260 FTE workers per year. The peak of construction employment will occur in the second year of construction when 400 FTE workers will be employed on the site[14];

(b) 83% of employees will be either fly-in, fly-out or drive-in, drive-out, from elsewhere in NSW, or with people relocating to Broken Hill for employment[15];

(c) given the anticipated impacts of the incoming Project workforce on local accommodation provision and the limited capacity of local providers to accommodate this workforce, the Proponent plans to develop a Workers Accommodation Facility. This will be located on privately owned land[16].

8.2.3 The EIS does not propose an approximate, or proposed, location for the Workers Accommodation Facility.

8.2.4 We strongly disapprove of the Accommodation Facility being located near our Property. If this is proposed, new assessments must be conducted to properly assess the cumulative impact of the Proposed Project and housing up to 400 personnel.

8.3 Relationship between Hydrostor and Perilya

8.3.1 The Proposed Project will be located on a combination of Crown land leased by, and (as we understand it to some extent) freehold land owned by, Perilya. Given our close proximity, we are intimately familiar with the mining operations and practices of Perilya.

8.3.2 The Proposed Project is conducted on Perilya land, and Perilya is a mining company with an established track record with the operation of its mines in Broken Hill. Hydrostor is not a mining company, and has no such established track record (or, to be clear, any track record) as a mining company with the experience to conduct activities on the project land which are, for all relevant purposes, mining activities.

8.3.3 This is important because the EIS does not make it clear whether Hydrostor is properly experienced and authorised to conduct the activities necessary for the Proposed Project. As the proponent, Hydrostor is responsible for the conduct and compliance of all activities in relation to the Proposed Project: and yet Hydrostor has no track record of successfully and safely engaging in significant mining activities, nor doing so in a compliant manner.

8.3.4 The EIS states that:

[14] Page 176 of the EIS.
[15] Page 176 of the EIS.
[16] Page 215 of the EIS.

(a) while the Project will interact with Perilya's existing mining operations, all associated excavation works to establish the underground cavern will be undertaken as part of this Project[17];

(b) no change is proposed to the existing Potosi mining operations, however, the existing development consents applicable to the existing mining operation will require minor modification to accommodate the Project[18];

(c) there are two separate Perilya mining areas in this part of the Perilya mining lease holdings, both subject to separate Development Consents issued by Broken Hill City Council under the EP&A Act:

(i) the Potosi Mine (2004, CML5); and

(ii) the Flying Doctor Deposit[19]; (2008, straddles CML5 and CML6);

(d) the Proposed Project will be located above the Potosi underground mine workings approximately 1.5 km from the Potosi Pit at almost the furthest underground extent of the mine, with the existing workings to provide access for the new underground storage cavern development[20]; and

(e) the Proposed Project does not impact on the mining areas associated with the Flying Doctor Deposit.

8.3.5 Insufficient information has been provided in the EIS in relation to:

(a) how the development applications for the Potosi Mine and the Flying Doctor Deposit will be modified;

(b) how the Proposed Project will interact with Perilya's mining operations. The cumulative impact of both projects ought to be considered; and

(c) dual project timelines, in particular whether there will be an overlap between Perilya's mining operations at the Flying Doctor Deposit and the Proposed Project. If there is any overlap, the assessments in relation to noise, light and air quality disturbances must be reproduced to accurately capture this.

8.3.6 The lack of information in the EIS, addressing this relationship is a significant concern, which ought to be considered in further detail by the Department.

8.3.7 Please refer to Schedule 3 for further detail.

8.4 Lighting policy

8.4.1 This is not the first time we have fought to protect our sky.

8.4.2 We have been communicating with the Broken Hill City Council in the hopes of implementing policies to protect and preserve our sky and the astronomy industry, since November 2014. While Council is supportive, our efforts are yet to see the introduction of a lighting policy. Nevertheless, we will continue to advocate for such change.

8.5 Other

[17] Page 3 of the EIS.
[18] Ibid.
[19] Page 10 of the EIS.
[20] Page 11 of the EIS.

8.5.1 In addition to the matters raised above, we also note our concerns in relation to:

(a) whether an energy generation facility is appropriate on a mining lease;

(b) whether, and if not why not, additional sites have been fully explored;

(c) the water supply which will be made available by the Stephens Creek Reservoir for the Proposed Project and why this supply is not available for our Property (noting that as part of the recent IPART water pricing determination, we were informed such water could not be made available);

(d) the structural damage that will be caused to our Property as a result of the blasting; and

(e) overall compliance measures.

9. Conclusion

9.1 We live in a mining town and are well acquainted with the drawbacks that come with living in a mining community. However, the Proposed Project not only threatens our livelihood which we have worked so hard to build, but also the cherished enjoyment of our Property and our day-to-day life.

9.2 The EIS has failed to alleviate or address our concerns in relation to the impact of lighting (particularly at night), noise, dust and nuisance caused as a result of this project. There are also fundamental inadequacies throughout the EIS (some of which are identified above) which ought to be considered before any further action is taken or approval considered.

9.3 Among the material concerns we have raised:

9.3.1 It is entirely unclear to us the legal rights which the Proponent holds which enable it to conduct the Proposed Project on the subject land, nor the basis upon which it could be established that the Proponent has the financial, technical, project and mining expertise to establish the Proposed Project, and operate it, in a safe and effective manner which will comply with its obligations (particularly obligations owed to neighbouring properties);

9.3.2 The EIS provides no assurance that the impacts of the Proposed Project have been reliably calculated, considered and mitigated, given the failure of the EIS to properly describe the location of the Proposed Project across the Potosi and Flying Doctor sites;

9.3.3 The EIS provides little assurance that the light, noise and dust impacts of the Proposed Project on us and our Property will be adequately managed, particularly where the EIS refers to incorrect Australian (AS/ANZ) Standards;

9.3.4 Issues raised in the EIS are considered in isolation, and the cumulative effects of different factors are not considered or addressed. By way of example:

(a) the impact of traffic to and from the site of the Proposed Project on the overall light, noise and dust effects of the project;

(b) the management of temporary or long-term stockpiles of soil (and other mined material), and haul roads, to suppress dust are given very little attention in the EIS;

(c) the extent to which noise levels will exceed current noise levels, given a huge 18 dB difference between normal noise levels and those which will result from the Proposed Project;

(d) the impact of accommodation (and its location) is not addressed in the EIS;

(e) the potential for the activities of the Proposed Project to overlap with further mining activities undertaken by Perilya on either their Potosi or Flying Doctor resources;

9.3.5 our independent noise reports underscore these concerns; and

9.3.6 these concerns are also underscored by the Proponent's apparent reluctance to establish any independent means by which continuing compliance with the Proposed Project can be measured and assessed.

9.4 In consequence of the above, we strongly oppose the approval of the Proposed Project and trust that the Department will take our submission into consideration during the decision making process.

Attachment 1 – Noise Report, Day Design Pty Ltd Acoustic Consulting Engineers (S. Gauld)

DAY DESIGN PTY LTD
CONSULTING ACOUSTICAL ENGINEERS

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Linda and Travis Nadge
18817 Barrier Highway
Broken Hill NSW 2880

13 October, 2023
Refer: 7876-1.1R

Attention: Ms Linda Nadge
Telephone: [redacted] **Email:** [redacted]

Dear Madam,

SILVER CITY ENERGY STORAGE SYSTEM

CO-LOCATED ON THE POTOSI MINE, BROKEN HILL

ACOUSTIC PEER REVIEW

Day Design has been engaged by Linda and Travis Nadge, residents of 18817 Barrier Highway, Broken Hill, to peer review a Noise Impact Assessment prepared to support the State Significant Development application (SSD-47065463) for the proposed "Silver City Energy Storage System" in response to the NSW Planning Secretary's Environmental Assessment Requirements (SEAR's).

A Noise Impact Assessment (NIA) has been prepared by Umwelt Environmental & Social Consultants (Umwelt) dated July 2023 (ref: 21982/R10).

The proposal is located in the existing Potosi Mine area within the *SP1: Special Activities* under the *Broken Hill Local Environmental Plan 2013*. The proposal will include significant noise generating plant and equipment located above ground to compress and release air stored in an underground chamber for the purposes of generating electricity.

The Site is described as being 1,130 m from your residential premises at 18817 Barrier Highway, Broken Hill, which is located on the outskirts of Broken Hill, to the north-east, along the Barrier Highway. Your property has also been developed to operate your business, Outback Astronomy.

The following report forms part of my review:

- **Noise Impact Assessment** (NIA), document reference 21982/R10, prepared by Umwelt Environmental & Social Consultants dated July 2023.

I did not speak to any employee of Umwelt to seek further information, during my review. I have carried out all calculations based on the assumptions and acoustic data provided in the NIA. My review is limited to the determination of the noise criteria for operational noise, and consideration of whether the calculated noise emission is likely to cause an acceptable noise impact or not. I offer the following comments:

Background Noise Levels

Ambient noise levels were measured in November 2022 at 18817 Barrier Highway, Broken Hill (identified as L1 and R2 in NCA 1) for the purposes of determining noise criteria for the NIA. The ambient noise level at your property is reportedly dominated by traffic on Barrier Highway, wind in the trees and birds, during the daytime (Table 3.5, NIA). In the evening, insects and frogs are prominent, together with distant traffic on the Barrier Highway. At night, the observations were similar to the evening.

The recorded background noise levels at L1 were 41 dBA in the daytime, 25 dBA in the evening and 17 dBA at night (Table 3.4, NIA).

In accordance with the requirements in the NSW Environment Protection Authority's (EPA) Noise Policy for Industry (EPA 2017), the noise criteria were determined to be 46 dBA in the daytime, 35 dBA in the evening and at night (Table 4.4, NIA).

The noise logger L1 was located at 18817 Barrier Highway, Broken Hill, which is slightly east of the Barrier Highway (Figure 3.3, NIA). A second noise logger, L2, was located on the north-east edge of the town, south-west of the Potosi Mine.

The noise logger data for L1 at night is typically less than 20 dBA and reported to be 17 dBA in Table 3.4 of the NIA. Technical data obtained for the noise logging instrument reveals that the noise floor (lowest possible measurement) of the sound level meter (Svantek 977, Section 3.3.1, NIA) used for the measurement is 16 dBA. It is likely that the noise floor of the instrument elevated the measured noise level at very low levels such that the measured background noise level of 17 dBA may have measured lower if a low noise level instrument had been used.

The impact of a very low background noise level is the noise emission from the proposal is permitted to be greater than the normal 5 dB above background, as the actual background or 17 dBA (or lower) is artificially increased to 30 dBA at night. The PNTL is set at 5 dB above 30 dBA, being 35 dBA. Therefore, the noise criterion of 35 dBA is 18 dB or more above the background noise level of 17 dBA, which is likely to cause greater annoyance.

Legal Precedent

The greater level of emergence above the background noise level will make the predicted noise levels from the proposal more noticeable and cause a higher level of impact on the residential acoustic amenity than in an environment where the measured background noise level is higher.

I presented expert acoustic evidence in the matter of the proposed Rocky Hill Mine in Gloucester Resources Limited v Minister for Planning (2019] NSWLEC 7[1] (Paragraph 240 ff) in 2018. The Chief Judge, Brian Preston agreed that the additional emergence of the mine noise level in areas where the background noise level was less than 30 dBA, would cause the noise emission from the mine to be more noticeable and would be more likely to affect the residents'

[1] https://www.caselaw.nsw.gov.au/decision/5c59012ce4b02a5a800be47f#_Toc431184

acoustic amenity. These residents, if opposed to the mine, would be more likely to find this new noise impact on their acoustic amenity to be unacceptable. (Para 260)

The background noise levels in the Gloucester Resources Limited matter were as low as 24 dBA. In the subject case, in Broken Hill, the background noise levels are significantly lower at night, being 17 dBA, which would exacerbate the noise impact further than in the Rocky Hill Mine matter, if the noise criterion recommended in the NIA were applied at night.

Noise Emission

The noise criterion is 35 dBA at night for noise from the proposal. I have not analysed the components that contribute to the likely noise emission to determine whether the noise emission is reasonable. In this review, I have assumed the noise emission will be as reported in the NIA.

The noise emission is created by components that emit up to 109 dBA sound power level (SWL) during the charge cycle and up to 105 dBA SWL during the discharge cycle (Table 5.1, NIA).

The calculated noise level at 18817 Barrier Highway, Broken Hill, identified as R2 in Table 5.3, will be up to 35 dBA during the start-up/charge cycle and up to 33 dBA during the start-up/discharge cycle. Standby mode will be up to 28 dBA.

These calculated noise levels are up to 18 dB above the measured background noise level (17 dBA) at night. While the predicted noise levels are reported to comply with the noise criteria determined in the NIA, the additional emergence above the background noise level is likely to cause residual noise impacts at R2. The noise levels from the proposal will be more noticeable than they would be in a measured background noise level of 30 dBA. Therefore, the noise impact on the residential acoustic amenity will be greater.

Noise Impact

The assessment location for noise impact is outside, within 30 metres of a residential dwelling, even at night. It is uncommon for residents to be outdoors at night. However, in this case, where the residential property is used to operate a quiet nocturnal business (Outback Astronomy), the noise impact at night, outdoors, is particularly relevant.

The noise emission (of up to 35 dBA) will be clearly audible during and dominate the acoustic environment at night at R2. It will create an unacceptable noise impact at 18817 Barrier Highway, Broken Hill for occupants and visitors to Outback Astronomy.

This unacceptable noise impact will comply with the noise criterion in the Noise Policy for Industry. The effect of the noise impact, is similar, although more profound, to the noise impact of the proposed and refused Rocky Hill Mine.

While the noise impact of the proposed Rocky Hill Mine was not sufficient to cause refusal of the development application alone, the Chief Judge found that the impacts did contribute to the adverse social impacts that were ultimately a ground for refusal.

In this case, I expect that the noise impact would cause significant detriment to the operation of Outback Astronomy at 18817 Barrier Highway, Broken Hill as the quiet background nature

of the property is a desirable feature for the nocturnal business, which would be eroded if the proposal were approved.

Noise Controls

A noise barrier is proposed on the southern side of the Cooling Water Air Cooled Exchanger and will be approximately 1 metre higher than the top of the unit (NIA, Section 5.3.1). It is unknown what the reduction in noise level at R2 would be due to the proposed noise controls as the 'before noise controls' noise level prediction is not provided.

Further noise controls could be introduced with the intent of reducing the noise impact of the proposal at 18817 Barrier Highway, Broken Hill.

Summary

It is my professional opinion that the Noise Impact Assessment prepared by Umwelt Environmental & Social Consultants dated July 2023, to support the State Significant Development application SSD-47065463 to NSW Department of Planning and Environment, demonstrates that the likely noise emission from the Silver City Energy Storage Project will cause an emergence of up to 18 dB above the existing background noise levels at 18817 Barrier Highway, Broken Hill.

This increased emergence, while complying with the noise criteria in the Noise Policy for Industry, will cause an unacceptable noise impact, especially at night.

We recommend that further noise controls be introduced to reduce the noise impact at 18817 Barrier Highway, Broken Hill to achieve an emergence of 5 dB above the background noise level.

Noise and Vibration), BE(Mechanical), MIEAust, MAAS

Principal Acoustical Consultant

for and on behalf of Day Design Pty Ltd

AAAC MEMBERSHIP

Day Design Pty Ltd is a member company of the Association of Australasian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

The undersigned hereby certifies that this Report has been checked and approved in accordance with our Quality Management System.

Date: 13/10/23

Attachment 2 - Renzo Tonin & Associates Noise Report

9/10/2023
TN417-01F01 Peer Review (r1)

Outback Astronomy

Att: Travis and Linda Nadge

Dear Sir/Madam,

Silver City Energy Storage Project – Review of Umwelt Noise and Vibration Impact Assessment

Introduction

We have been engaged by the operators of the Outback Astronomy site (18817 Barrier Highway, Broken Hill) to review the acoustic report prepared as part for the State Significant Development Application for the Silver City Energy Storage project.

As part of this review we have been provided with:

- *Noise and Vibration Impact Assessment* by Umwelt dated 17/7/2023 (Final Revision).
- Supplementary acoustic analysis of specialist equipment/acoustic enclosures by Haritz + Rohring GmbH.

In short, our comments are:

- The Outback Astronomy site has been taken into account in the Umwelt Acoustic analysis for the project:
    - The Umwelt report has identified that the Outback Astronomy site includes a residential component and has set noise emission targets based on this.
    - The strictest possible noise emission goals under the EPA Noise Policy for Industry (based on residential use and quietest possible background noise levels) has been set.
    - We agree with this approach.
- Our primary concern is that there are a number of extremely loud equipment items that are proposed (135-153dB(A) – as loud as jet engines). These equipment items are proposed to be housed in acoustic enclosures. However:

- In order to conduct the noise emission assessment, Umwelt have been provided with information about noise emanating through the enclosure walls and out of the openings in the enclosure (ventilation/duct openings). This information has been provided by Haritz + Rohring GmbH (H+R), yet this is not part of the DA documentation and the noise level emanating from enclosures has had to be taken at face value. The details of the sound levels of the equipment items and the acoustic treatments to the enclosure/ventilation openings are not included in the Umwelt report.

- This means large amounts of information relevant to the acoustic assessment are not included in the SSDA Noise and Vibration Impact Assessment.

- This creates the risk that the information provided to Umwelt for the noise modelling cannot be properly scrutinised by either Umwelt or the acoustic expert for the consent authority (we assume EPA or DPIE).

- On our review of the supplementary information from Haritz + Rohring GmbH:

  - The H+R information in itself is also incomplete, as it refers to acoustic data sheets for specialist equipment that is not included in their report.

  - There is no information about enclosure wall build ups to substantiate the enclosure noise reductions that have been relied on by Umwelt.

  - There are steps in their calculation process that potentially underpredict the noise that will be emitted from the site.

  - They have made noise propagation predictions to nearby properties that are inconsistent with those in the Umwelt report. H+R predict exceedances of noise goals and this prediction is made only of a limited number of equipment items (not a cumulative prediction of all equipment) and without taking into account noise enhancing meteorological conditions that could further increase emitted noise.

  Given this, we believe that additional information should be provided as part of the SSDA documentation and that no meaningful assessment of the noise emissions from the development can be undertaken by the consent authority without further information.

Noise Emission Goals

The Outback Astronomy lies 1,130m from the proposed Silver City Energy Storage project. The site is used as an observatory and also includes a residential component.

We understand that a key component of the use of the observatory is the night time use of outdoor aeras, and as such, excessive noise levels (at night) will potentially impact both the residential and commercial use of the site.

We note that as part of their acoustic analysis, Umwelt undertook long term noise logging at the Outback Astronomy and measured extremely low background noise levels (25dB(A)L_{90} in the evening, 17dB(A)L_{90} at night – Umwelt report, table 3.4).

While the Umwelt proposed evening and night time noise goal of 35dB(A) is consistent with the strictest application of the EPA Noise Policy for Industry, this still will result in an increase in existing background noise levels of 18dB(A).

Acoustic Analysis – Operational Noise

The Umwelt acoustic report provides a detailed list of key noise generating equipment items in table 5.1. On the face of it, equipment items appear moderate but not extremely loud (109dB(A) being the loudest – the sound power for the LP Air Intake Filterhouse).

At 1.1km distance (distance from the site to the Outback Astronomy), it would be feasible to meet a 35dB(A) noise goal or similar.

However, looking at the H+R calculations, it is important to ensure that the information provided to Umwelt for their modelling is correct.

AR105 Compressor with Motor.

The Filterhouse contains a AR105 Compressor with Motor.

The AR105 compressor sound power (ie – the equipment noise level at 0m distance) is 153dB(A). This noise level has been calculated by H+R based on a specification by some third party. There is no information about the noise level measurements/data sheets that have been used to determine the compressor sound power level.

The calculation sheets show a series of acoustic treatments to the ductwork connecting the compressor to the opening in the enclosure. These acoustic treatments consist of a 3m long in-duct rectangular acoustic attenuator (providing approx. 25dB(A) noise reduction) and an "Attenuation Filter" (providing 20dB(A) noise reduction).

While the 25dB(A) reduction for the 3m rectangular attenuator is reasonable, there is no information about what the "Attenuation Filter" is, or if the further 20dB(A) reduction is reasonable. The Umwelt

report (table 5.1) does not reference the air-attenuation filter, meaning that there are acoustic treatments that are relied on in noise modelling that are not identified in the Umwelt acoustic report.

There is no way to verify if the 20dB(A) loss associated with the attenuation filter is reasonable. Further, there is no drawing of the internal configuration of the unit, duct run, rectangular attenuator, attenuation filter to verify that it all fits in the enclosure and that there will be no issues of noise break in to the ductwork.

At 109dB(A), this is one of the loudest equipment items used outside of emergency, and any error in the 109dB(A) noise source used by Umwelt will result in an overall increase in noise emitted by the site.

See Appendix A.

Enclosure shell noise breakout

Similarly, the noise breakout through the shell of the compressor enclosures is a concern.

The RG080 compressor with Motor have sound powers of 134.7dB and 114.3dB(A) respectively. Again, this is based on data sheets that are not included in the analysis.

In order to examine noise breakout through the shell of the enclosure, it is necessary to determine the average noise level throughout the inside of the enclosure (ie – what is the noise level created within the enclosure shell when an object with sound energy 134.7dB(A) is placed in it).

Looking at the H+R calculations, a noise loss of 27dB(A) is applied when determining noise level within the enclosure (commonly called a "room correction").

A room correction for an enclosure will vary depending on the size of the enclosure and whether there are noise absorptive linings in it. In this case, the enclosure is 15m by 9.75m by 7.2m. In our opinion a room correction of 27dB(A) is not possible in space of this size, even if all surfaces have noise absorptive lining. It is more likely between 15-20dB(A). This means that the noise emission via the enclosure casing is potentially 7-12dB(A) underpredicted.

If this is in fact the case, a different type of enclosure build up may be required. While the build up of the enclosure is not nominated in any of the acoustic reports, we understand that the enclosure is proposed to be sheet metal with acoustic lining to the inside (with perforated metal facing). We anticipate that this would not be sufficient, and that a double skin or concrete panel system will be needed. This would be a major cost item, could not be easily retrofitted and should be determined with greater certainty at this SSDA stage.

See Appendix B.

Sound Power of Major Equipment Items

Ensuring that equipment noise levels are correct when used in noise emission calculations is critical. If source data is incorrect, all predictions will also be incorrect.

Determining the correct sound power (noise level at source) for large equipment items is complex and typically requires a series of measurements made at various locations around the item and a calculation conducted to determine the "at source" noise level based (a procedure prescribed by ISO3744 or 3745). If done incorrectly, the "at source" level will be incorrect. Without any equipment noise data sheets (particularly for the extremely loud equipment items being the AR105 Compressor with Motor, RG080 Compressor with Motor and the MAT 120 Turbine with generator), it is impossible to verify if many of the primary noise source items used by Umwelt are correct.

The data sheets should be provided. Ideally, these would include the actual measurement results, and not simply with sound power level that was calculated based on the set of measurements.

Noise Emission Predictions to Outback Observatory.

Table 5.4 of the Umwelt report presents predicted noise levels, including to the Outback Astronomy site.

The table indicates that in some instances (eg – Charge cycle during Nor-westerly wind or temperature inversion) predicted noise levels exactly matching allowable levels. In some other conditions, the predicted noise levels are within 1-2dBA) of allowable targets.

There is no obligation to do better than the EPA requirement. However our concern there is effectively a "black box" in terms of the noise within the enclosures (being the change in noise level between the equipment item itself, and the noise emanating from the opening of the enclosure). This "back box" accounts for up to 45dB(A) noise adjustments, and are not detailed in the Umwelt report (being the 153dB(A) equipment sound power and 108dB(A) noise source used in their modelling).

The 45dB(A) "gap" is addressed in the H+R reporting, however is not included in the SSDA materials. Further, in some instances that reporting is also not adequately comprehensive (they rely on further information in data sheets that are also not provided).

Given noise emissions are already predicted to be exactly on the allowable level, in the event that there are any under-predictions in the noise levels relied on by Umwelt, it is highly likely this will result in non-compliant noise levels at Outback Astronomy.

Further, the H+R reporting also provides predictions of operational noise to Outback Astronomy (Appendix 3). In this case, the noise level is predicted by them to exceed that 35dB(A) noise target. Additionally, the H+R prediction does not appear to take into account noise enhancing meteorological conditions, which would further increase noise emissions.

While we assume that the Applicant relies on the Umwelt reporting for external noise propagation, this highlights the narrow degree of non-compliance and the high risk associated with even small underprediction in the noise source levels provided to Umwelt for their modelling.

Commentary – Construction Noise

Construction Noise and Vibration Management Plan should be required to be prepared (this is a typical requirement in any condition of approval for development of this nature).

In particular, the CNVMP should outline:

- If vibration intensive activities are proposed (blasting) and provide commentary with respect to vibration impact on nearby development (in particular in the event that it could necessitate recalibration of telescopes or similar).
- If construction work is proposed outside of standard hours, and if so, how the work will comply with EPA Interim Construction Noise Guideline for outside of works.
- Should be approved by consent authority (not private certifier).

Closure

We note in the Umwelt Report the noise emissions to the Outback Astronomy site are predicted to be just compliant with the 35dB(A) allowable noise emission (table 5.4 of Umwelt report). This prediction is based on no application of a penalty for low frequency content, which is only just avoided. The noise emissions would become non-complaint if a penalty was applied.

Further, the Haritz + Rohring GmbH predictions for the same equipment operation are higher, and were made for only a selection of equipment (not all items). Further, the H+R predictions do not take into account noise enhancing meteorological conditions. The H+R predictions indicate non-compliance with noise emission goals at the Outback Astronomy site.

At best, the site is anticipated to be just compliant with no margin for error. However on review of the above, the information supplied in the SSDA acoustic report is lacking important detail. In some cases there is a risk that the noise levels relied on by Umwelt in their predictions are actually underpredicted, creating a further risk of exceedance of noise goals.

The equipment in question and the acoustic treatments are highly specialised. Rectification in the event of non-compliance would be expensive and time consuming. In the event that during commissioning/testing the operational noise was found to be excessive, there is a risk that:

- Either the site could not commence operation as planned (delay) or
- Operations would commence but there could be a substantial time period in order to complete noise rectification works and during this period the Outback Astronomy operators would be exposed to excessive noise that may impact both the accommodation component or commercial aspects of the Observatory.

While we acknowledge that a degree of design finalisation can be conducted post development approval. However we think it reasonable that for such noise intensive/bespoke equipment that further information is demonstrated that the project is capable of meeting its noise emission requirements.

In light of the above, we recommend:

- H+R acoustic data and predictions should be included in the SSDA package.
- Additional information should be included in the SSDA package, being:
    - AR105 Compressor with Motor (induct and case radiated)
    - RG080 Compressor with Motor (induct and case radiated)
    - MAT 120 – Turbine with Generator (induct and case radiated).

    Ideally, these data sheets would detail the measurement positions made around the equipment items to substantiate how the sound power was calculated.

- The 27dB(A) noise loss for spatially averaging the equipment noise within the enclosures should be verified or acoustic treatments of the enclosure walls amended to provide a higher level of noise attenuation.
- The build up of the enclosure walls should be provided to verify the transmission loss claimed.
- Detail of the Filterhouse Attenuation Filter should be provided.
- Schematic drawings inside the enclosures should be provided showing the equipment items and duct arrangements to ensure that the (in some cases) 3m long induct attenuators, filter attenuators and duct runs can fit.
- The discrepancies between the Umwelt predictions and H+R noise propagation predictions explained.

Without the above information, in our opinion it is not possible for us (or a consent authority) to determine that the site can operate without excessive noise impact.

Regards,

Thomas Taylor
Principal Engineer
Thomas.Taylor@renzotonin.com.au

Appendix A - Review of Calculation – AR105

A. AR105 Compressor with Motor (for Charge Cycle)

A.1 Filterhouse

A.1.1 Filterhouse Air Inlet

Lp(lin) Compressor Sound Pressure Level inside Duct (as specified by MAN)	127,0	128,0	127,0	126,0	124,0	137,0	135,0	131,0	**140,7**
A-weighting	-26,2	-16,1	-8,6	-3,2	0,0	1,2	1,0	-1,1	
Lp(A) Compressor Sound Pressure Level inside Duct	100,8	111,9	118,4	122,8	124,0	138,2	136,0	129,9	**140,8**
Surface Level: 17,9 m² calculated from 1/1-circle, r= 2,4m	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	
PWL(A) Compressor Sound Power Level inside Duct	113,3	124,4	130,9	135,3	136,5	150,7	148,5	142,4	**153,4**
absorptive silencer (rectangular), (WxH): 7,5m x 4m, L=3000mm, deltaP=210Pa	-13,0	-27,2	-35,8	-41,8	-43,5	-40,0	-25,8	-16,4	
PWL(A) downstream of silencer excl. Flow Noise	100,3	97,2	95,1	93,6	93,1	110,7	122,7	126,0	**127,8**
LwA Flow Noise Silencer (Row 16) - A-weighted	51,9	62,0	69,3	70,0	68,5	65,1	60,2	53,4	**75,0**
PWL(A) downstream of silencer incl. Flow Noise	100,3	97,2	95,1	93,6	93,1	110,7	122,7	126,0	**127,8**
Attenuation Filter	-1,6	-5,8	-8,2	-12,2	-12,5	-16,8	-17,9	-22,8	
PWL(A) Air Inlet	**98,7**	**91,4**	**86,9**	**81,4**	**80,6**	**93,9**	**104,8**	**103,2**	**108,0**

No data sheet provided

Cannot verify that this is correct if source data is not known.

No information about Attenuation Filter (20dB(A) attenuation)

Cannot verify that 108dB(A) at opening (used in Umwelt Calculation) is correct.

Appendix B - Review of Calculation – Enclosure Case Radiation

B. RG080 Compressor with Motor (for Charge Cycle)

B.1 Compressor Casing with Motor

B.1.1 Sound Enclosure Walls

PWL(lin) Compressor acc. Noise Data Sheet B.0221064.02 (Rev. 30.01.2023)	111,0	111,0	116,0	121,0	126,0	128,0	132,0	121,0	**134,7**
PWL(lin) Motor acc. Noise Data Sheet B.0221064.02 (Rev. 30.01.2023)	106,0	111,0	103,0	103,0	100,0	107,0	88,0	79,0	**114,3**
Total PWL(lin) RG080 Compressor with Gearbox and Motor	112,2	114,0	116,2	121,1	126,0	128,0	132,0	121,0	**134,7**
A-weighting	-26,2	-16,1	-8,6	-3,2	0,0	1,2	1,0	-1,1	
Total PWL(A) RG080 Compressor with Gearbox and Motor	86,0	97,9	107,6	117,9	126,0	129,2	133,0	119,9	**135,3**
PWL(A) Sound Power Level 3x Axial Fans (acoustic data as per supplier WMB)	68,8	80,8	88,8	93,8	95,8	94,8	91,8	85,8	**100,8**
PWL(A) Sound Power Level Train + Fans	86,1	98,0	107,7	117,9	126,0	129,2	133,0	119,9	**135,3**
Diffuse field SPL inside enclosure	64,5	72,9	81,3	90,7	98,9	102,1	105,9	92,5	**108,2**
Rres of enclosure walls without leakages	17,7	23,3	26,4	30,1	27,8	38,4	46,6	20,0	
Insertion Loss Noise enclosure (LxWxH): 15m x 9,75m x 7,2m, percentage of l	14,2	21,5	25,0	28,9	26,6	37,2	45,4	18,8	
External Sound Power Level of enclosure walls	71,8	76,5	82,7	89,0	99,4	92,0	87,6	101,1	**103,9**

No data sheet provided

27dB(A) reduction between equipment item sound power and average noise level within 15mx10mx7m enclosure likely to be excessive. More likely a 15-20dB(A) reduction. Noise breakout potentially 7-12dBA() underestimated

No information of enclosure shell build up to substantiate transmission loss claimed for enclosure walls. Potential need for double wall lining or masonry lining.

Noise level used by Umwelt in propagation modelling potentially underpredicted, meaning Umwelt predictions to Outback Astronomy also underpredicted.

Appendix C – H+G Noise Prediction to Outback Astronomy (R2)

D.4.3 Total Sound Pressure Level at R2

Partial Lp(A) at R2 for Train 1 for Charge Cycle	26,4	21,0	18,6	23,0	23,2	15,3	-12,7	-130,7	**30,3**
Partial Lp(A) at R2 for Train 2 for Charge Cycle	26,8	21,5	19,1	23,5	23,9	16,3	-10,2	-122,6	**30,8**
Total Lp(A) at R2 for Charge Cycle	29,6	24,3	21,9	26,3	26,5	18,9	-8,3	-122,0	**33,6**
Difference of C- and A-weighted overall noise levels									**21,6**
reverse A-weighting	26,2	16,1	8,6	3,2	0,0	-1,2	-1,0	1,1	
Total Lp(Z) at R2 for Charge Cycle	55,8	40,4	30,5	29,5	26,5	17,7	-9,3	-120,9	**55,9**
Penalty for low frequencies	5,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	
Total Lp(A) at R2 for Charge Cycle incl. Penalty	34,6	24,3	21,9	26,3	26,5	18,9	-8,3	-122,0	**36,3**

Exceeds 35dB(A) noise target and does not include the influence of noise enhancing conditions (wind or temperature inversion).

Schedule 2 – Confidential Business Information

Schedule 3 – Regulatory Concerns