REPORT

PRIVATE HELIPAD

360 PHOENIX MINE ROAD

NOISE IMPACT ASSESSMENT

RWDI # 2101637

April 1, 2021

SUBMITTED TO

Peter Basha
Principal
Peter Basha Planning & Development
PO Box 1827
Orange, NSW 2800
peter@bashaplanning.com.au

SUBMITTED BY

Nic Hall
Senior Engineer
Nic.hall@rwdi.com

RWDI Australia Pty Ltd (RWDI)
272 Pacific Highway – Level 4
Crows Nest, NSW, Australia, 2065
T: +61.2.9437.4611
E-mail: solutions@rwdi.com
ABN: 86 641 303 871

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Draft	15 February 2021	Nic Hall	John Wassermann
A	Final	1 April 2021	Nic Hall	John Wassermann

NOTE

All materials specified by RWDI Australia Pty Ltd (RWDI) have been selected solely on the basis of acoustic performance. Any other properties of these materials, such as fire rating, chemical properties etc. should be checked with the suppliers or other specialised bodies for fitness for a given purpose.

The information contained in this document produced by RWDI is solely for the use of the client identified on the front page of this report. Our client becomes the owner of this document upon full payment of our **Tax Invoice** for its provision. This document must not be used for any purposes other than those of the document's owner. RWDI undertakes no duty to or accepts any responsibility to any third party who may rely upon this document.

WILKINSON MURRAY

In October 2020, Wilkinson Murray Pty Limited merged with RWDI Group, a leading international consulting firm. Wilkinson Murrays core practise areas of noise, acoustics, vibration and air quality consulting built since 1962 servicing Australia and Asia-Pacific region will complement RWDI practise areas. Combined, RWDI+Wilkinson Murray is one of the largest teams globally specialising in the area of noise, acoustics, vibration and air quality.

RWDI

RWDI is a team of highly-specialised consulting engineers and scientists working to improve the built environment through three core areas of practice: building performance, climate engineering and environmental engineering. More information is available at www.rwdi.com.

QUALITY ASSURANCE

RWDI Australia Pty Ltd is committed to and implemented AS/NZS ISO 9001:2015 "Quality Management Systems – Requirements".

TABLE OF CONTENTS

1 INTRODUCTION

A new private helipad is proposed at 360 Phoenix Mine Road, Huntley (the Proposal). Up to seven helicopter movements (i.e. take-offs or landings) would occur, during daytime hours (7am – 6pm).

RWDI has been engaged to prepare a noise impact assessment for the Proposal.

1.1 Project Description

The Proposal involves the establishment and use of a private helipad at 360 Phoenix Mine Road, Huntley.

An existing farm shed will be used to house the helicopter. The concrete helipad is located just to the west of the existing shed, as shown in Figure 1

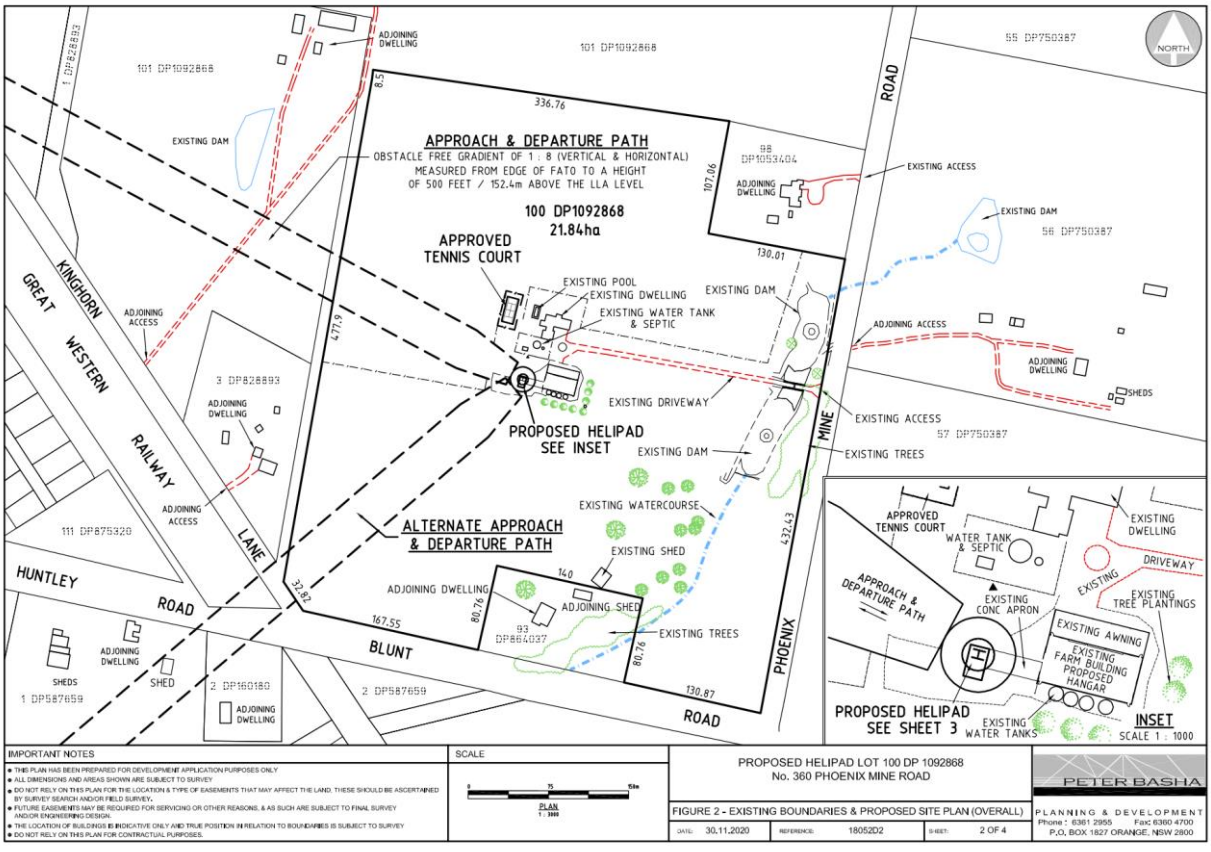

Figure 1: Site Plan

Helicopter movements would be limited to seven (7) per week. The helipad would be used only by the property owner. Refuelling of the helicopter will occur away from the site.

1.2 Sensitive Receivers

The nearest and most potentially affected sensitive receivers are the four rural dwellings, shown in Figure 2 and summarised in Table 1.

Figure 2: Sensitive Receivers

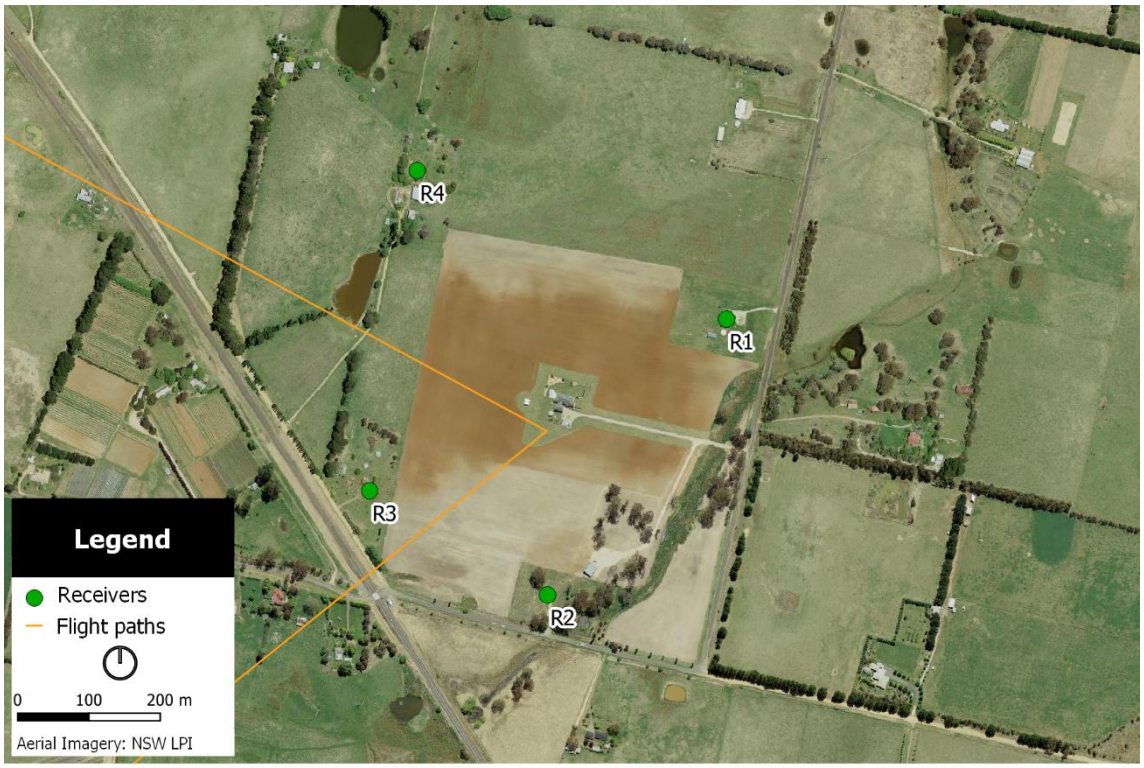

Table 1: Sensitive Receivers

Receiver	Address	Distance to Helipad (m)
R1	346 Phoenix Mine Road	260
R2	23 Blunt Road	190
R3	14 Kinghorn Lane	230
R4	28 Kinghorn Lane	370

2 NOISE CRITERIA

2.1 Noise from Aircraft Movements

There is no New South Wales noise policy concerning noise from helicopter flights. In a recent decision by the Land and Environment Court (Nessdee Pty Limited c Orange City Council [2017] NSWLEC 158), the Court accepted the opinion of the acoustic experts for both parties that the noise should be assessed "by applying the ANEF system for determining the acoustic acceptability of noise around the heliport. The criteria for aircraft noise are set out in Australian Standard AS2021 *Acoustics – Aircraft noise intrusion – Building siting and construction"*.

ANEF is the Australian Noise Exposure Forecast and is used across Australia in assessing noise from airports in relation to land use planning.

The criterion accepted by the Court was that noise contribution of helicopters using a helipad should be less than ANEF 13, which is equivalent to $L_{Aeq,24hour}$ 48 dBA, at residences for new helipads.

The above $L_{Aeq,24hour}$ and L_{Amax} criteria are considered suitable for assessment of potential noise impacts from the Proposal.

2.2 Noise from Ground Operations

For noise other than from aircraft movements – for example, while helicopters are on the ground and for any other ground-based operation – noise should be assessed according to the provisions of the *Noise Policy for Industry* (NPfI).

The NPfI recommends the development of project noise trigger levels, which provide a benchmark for assessing a proposal or site. The project noise trigger levels should not be interpreted as mandatory noise criteria but, rather, as noise levels that, if exceeded, would indicate a potential noise impact on the community.

The project noise trigger level is the lower value of the project intrusiveness noise level and the project amenity noise level. The project intrusiveness noise level assesses the likelihood of noise being intrusive above the ambient noise level and is applied to residential receivers only. The project amenity noise level ensures the total industrial noise from all sources in the area does not rise above a maximum acceptable level.

2.2.1 Project Intrusiveness Noise Levels

The intrusiveness noise level is the noise level 5 dBA above the background noise level for each time period (daytime, evening or night time) of interest at a residential receiver. The background noise level is derived from measured L_{A90} noise levels.

The NPfI stipulates that project intrusiveness noise levels should not be set below 40 dBA during the daytime and 35 dBA in the evening and night time. Additionally, the NPfI recommends that the project intrusiveness noise level for evening is set at no greater than that for the daytime, and that the project intrusiveness level for night time is set at no greater than that for the evening and daytime.

A conservative approach has been adopted in this assessment whereby the minimum project intrusiveness noise level of 40 dBA has been adopted for the daytime and 35 dBA for both the evening and night time. Intrusiveness noise levels for the project are summarised in Table 2.

Table 2: Project Intrusiveness Noise Levels

Receiver	Time of Day [a]	Project Intrusiveness Noise Level (dBA)
All nearby residential	Day	40
	Evening	35
	Night	35

a. Day = 7am – 6pm; evening = 6pm – 10pm; night = 10pm – 7am.

2.2.2 Project Amenity Noise Levels

Project amenity noise levels aim to set a limit on continuing increases in noise levels from all industrial noise sources affecting a variety of receiver types; that is, the ambient noise level in an area from all industrial noise sources remains below recommended amenity noise levels.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5dBA below the recommended amenity noise level.

- The following exceptions apply to determining the project amenity noise level:
- For high-traffic areas the amenity criterion for industrial noise becomes the $L_{Aeq,period(traffic)}$ minus 15dBA.
- In proposed developments in major industrial clusters.
- If the resulting project amenity noise level is 10dB or more, lower than the existing industrial noise level, the project amenity noise level can be set at 10dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.
- Where cumulative industrial noise is not a consideration because no other industries are present in, or likely to be introduced into the area, the relevant amenity noise level is assigned as the project amenity noise level for the development.

Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess mitigation options and determine achievable noise requirements.

The project amenity noise levels are calculated from the recommended amenity noise levels presented in Table 3.

Table 3: Recommended Amenity Noise Levels

Receiver	Noise Amenity Area	Time of Day [1]	Recommended Amenity Noise Level ($L_{Aeq,period}$ dBA)
Residential	Rural	Day	50
		Evening	45
		Night	40
	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45
Hotels, motels, caretakers' quarters, holiday accommodation, permanent resident caravan parks	See column 4	See column 4	5dB(A) above the recommended amenity noise level for a residence for the relevant noise amenity area and time of day.
School classroom-internal	All	Noisiest 1-hour period when in use	35
Hospital ward internal external	All	Noisiest 1-hour	35
	All	Noisiest 1-hour	50
Place of worship-internal	All	When in use	40
Area specifically reserved for passive recreation (e.g. national park)	All	When in use	50
Active recreation area (e.g. school playground, golf course)	All	When in use	55
Commercial premises	All	When in use	65
Industrial premises	All	When in use	65
Industrial interface (applicable only to residential noise amenity areas)	All	All	Add 5dB(A) to recommended noise amenity area

1. Day = 7am – 6pm; evening = 6pm – 10pm; night = 10pm – 7am.

Recommended amenity noise levels presented in Table 3 represent the objective for total industrial noise at a receiver location. In the case of a single new noise source being proposed, the project amenity noise level represents the objective for noise from a single industrial development at the receiver location. This is calculated as the recommended amenity noise level minus 5dBA.

Due to different averaging periods for the $L_{Aeq,15min}$ and $L_{Aeq,period}$ noise descriptors, the values of project intrusiveness and amenity noise levels cannot be compared directly when identifying noise trigger levels i.e.; the most stringent values of each category. In order to make a comparison between descriptors, the NPfI assumes that the $L_{Aeq,15min}$ equivalent of an $L_{Aeq,period}$ noise level is equal to the $L_{Aeq,15min}$ level plus 3dB.

Residential receivers near the Proposal are classified as being in a "rural" noise amenity area. The project amenity noise levels for the Proposal are presented in Table 4.

Table 4: Project Amenity Noise Levels

Receiver	Time of Day [1]	Recommended Amenity Noise Level ($L_{Aeq,period}$)	Project Amenity Noise Level ($L_{Aeq,15min}$)
All nearby residential	Day	50	48
	Evening	45	43
	Night	40	38

1. Day = 7am – 6pm; evening = 6pm – 10pm; night = 10pm – 7am.

2.2.3 Project Noise Trigger Levels

Table 5 below shows the project noise levels for sensitive receivers, with the project noise trigger levels shown in bold.

Table 5: Project Noise Trigger Levels

Receiver	Time of Day [1]	Project Intrusiveness Noise Levels ($L_{Aeq,15min}$)	Project Amenity Noise Levels ($L_{Aeq,period}$)
All nearby residential	Day	**40**	48
	Evening	**35**	43
	Night	**35**	38

1. Day = 7am – 6pm; evening = 6pm – 10pm; night = 10pm – 7am.

3 NOISE ASSESSMENT

3.1 Measured Noise Levels

Operational noise levels from a Robinson R44 helicopter were previously measured by Wilkinson Murray at a small private helipad at Nelson Bay Road, Salt Ash on Wednesday 10 July 2013. Measurements of typical helicopter operations were conducted at a distance of 40 metres from the helipad.

The measurements were conducted using a Bruel and Kjaer Type 2260 Sound Level Meter. This sound level meter conforms to Australian Standard 1259 *Acoustics – Sound Level Meters* as a Type 1 Precision Sound Level Meter which has an accuracy suitable for field and laboratory use. The A-Weighting filter of the meter was selected and the time weighting was set to "Fast". The calibration of the meter was checked before and after the measurements with a Bruel and Kjaer Type 4231 sound level calibrator and no significant drift was noted.

When the helicopter takes-off, it goes through a warm-up process for one and a half minutes, after which it lifts-off and departs the area. The aircraft is audible for about 30 seconds once in the air. Similarly, the landing event of the helicopter consists of an approach where the flying aircraft is audible for about one minute, and a touch down followed immediately by a two-minute cool down period. Measurements of these events are summarised in Table 6.

Table 6: Measured Noise Levels

Activity	Measured Noise Level (SEL, dBA)
Warm-up	78
Take-off	93
Landing	88
Cool-down	80

3.2 Predicted Noise Levels

Noise levels at sensitive receivers have been predicted based on the measured noise levels presented in Table 6 and the location of sensitive receivers relative to the helipad and the proposed flight paths. Noise levels associated with the stationary helicopter (i.e. warm-up and cool-down) have been predicted using a point-source approximation and the distance from the receiver to the helipad. Noise levels associated with aircraft movements have been predicted using a line-source approximation and the distance from the dwelling to the nearest point along the flight path.

Noise levels associated with ground-operations at the proposed helipad are presented in Table 7. The results in Table 7 indicate compliance with the established criterion.

Table 7: Predicted $L_{Aeq,15min}$ Noise Levels – Ground Operations

Receiver	Predicted $L_{Aeq,15min}$ Noise Level (dBA)		Criterion	Complies?
	Warm-up	Cool-down		
R1	32	34	40	Yes
R2	35	37	40	Yes
R3	33	35	40	Yes
R4	29	31	40	Yes

Noise levels associated with aircraft movements from the proposed helipad are presented in Table 8 and show $L_{Aeq,24hour}$ noise levels associated with take-off and landing along both the north and south flight paths. The "Maximum Combined" noise levels in Table 8 represent the total $L_{Aeq,24hour}$ noise levels at each receiver associated with a single flight (i.e. one take-off and one landing) along the flight paths that generate the highest noise levels for each receiver. The results in Table 8 indicate compliance with the established criterion.

Table 8: Predicted $L_{Aeq,24hour}$ Noise Levels – Aircraft Movements

Receiver	Predicted $L_{Aeq,24hour}$ Noise Level (dBA)					Criterion	Complies?
	Take-off		Landing		Maximum Combined [1]		
	N	S	N	S			
R1	35	35	30	30	36	48	Yes
R2	37	36	32	31	39	48	Yes
R3	37	41	32	36	42	48	Yes
R4	36	34	31	29	37	48	Yes

1. Total $L_{Aeq,24hour}$ noise level from one flight, taking off and landing along noisiest path for each receiver.

4 CONCLUSION

A noise assessment has been conducted for a proposed private helipad at 360 Phoenix Mine Road, Huntley.

Noise criteria for ground operations have been established in accordance with the *Noise Policy for Industry.* Noise conditions recommended by the NSW Land and Environment Court have been used as criteria to assess noise from aircraft movements.

Noise levels at nearby sensitive receivers have been predicted based on noise levels from a Robinson R44 helicopter previously measured by Wilkinson Murray.

Predicted noise levels at nearby receivers comply with the established criteria.