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PLANNING PANELS VICTORIA

SHENSTONE PARK PRECINCT STRUCTURE PLAN
WHITTLESEA AMENDMENT C241

STATEMENT OF EVIDENCE OF CHRISTOPHE FREDERIC DELAIRE

Prepared for: 1100 Donnybrook Road Pty Ltd

Instructed by: Hall & Wilcox

Date of last site inspection: Not performed due to current COVID-19 restrictions

Date of Statement of Evidence: 28 October 2020

Document reference: Ev 002 20200825

1.0 NAME AND ADDRESS

1.1 CHRISTOPHE FREDERIC DELAIRE

Co-CEO of Marshall Day Acoustics Pty Ltd

1.2 6 Gipps Street, Collingwood

Victoria 3066

2.0 AREA OF EXPERTISE

2.1 For over 18 years I have worked in the field of acoustics and noise control.

2.2 I am a member of the Australian Acoustical Society (MAAS)

2.3 My qualifications and experience are detailed in Appendix A.

2.4 I am sufficiently expert to make this statement because I have been involved in numerous environmental noise impact assessments for major environmental projects such as quarries, mines, landfills, wind farms and industrial plants.

3.0 SCOPE

3.1 Amendment C241 to the Whittlesea Planning Scheme (the Amendment) involves a review of the Shenstone Precinct Structure Plan dated September 2019 (the PSP).

3.2 I am aware that VPA has tables a mark up of the PSP dated 20 October 2020. The relevant content of the PSP has not been modified in the latest update.

3.3 1100 Donnybrook Road Pty Ltd (a related entity of Ouson) owns the property at 1100 Donnybrook Road, Donnybrook VIC 3064 which is included within the PSP and is a submitter (Submission 20) to the Amendment. This property is referred to herein as the *Ouson land holding*.

3.4 The PSP area contains the existing Woody Hill Quarry and to the south of the PSP but outside the precinct area is the proposed Phillips Quarry.

3.5 It is noted that 1100 Donnybrook Road Pty Ltd also owns the parcel of land immediately to the south of the Ouson land holding, that is outside the PSP area and adjacent to the east boundary of the proposed Phillips Quarry..

3.6 Noise, vibration and blast buffer zones are presented in the PSP around both the existing Woody Hill Quarry and the proposed Phillips Quarry.

3.7 The buffers have been determined based on the findings of the GHD report Ref 313 5311 *Impact Assessment Report for the Shenstone Park Precinct Structure Plan*, dated December 2017 (the GHD Report).

3.8 The Ouson land holding is currently also impacted by a number of buffers around the proposed Phillips Quarry.

3.9 I have been instructed by Hall & Wilcox, on behalf of 1100 Donnybrook Road Pty Ltd to *prepare expert acoustic evidence in relation to the merits of the Amendment with a focus on the buffers to the former Phillips Quarry as it impacts the Ouson land holding in the PSP*.

3.10 I have also been instructed to comment on the potential acoustic impact from the existing City Gate facility located to the northwest of the Ouson land holding.

3.11 My instructions are specific to acoustic related impacts from the proposed Phillips Quarry. Vibration and blast related impacts are addressed in Timothy Michael Marks' witness statement.

3.12 In preparation of my witness statement, I have reviewed relevant sections of the documents listed in Appendix B.

3.13 I prepared this statement of evidence with the assistance of the Marshall Day Acoustics' staff members listed in Table 1.

Table 1: Assisting MDA staff members

Staff member	Title	Tasks	Qualification
Mark Webber	Consultant	Noise modelling	M.ArchSc. (Audio and Acoustics)
Ben Beverley	Senior consultant	Review of noise model	M.Des.Sc. (Audio & Acoustics)
Timothy Marks	Consultant Former Associate Director	Review of evidence	B.Eng (Mech) (Hons) / M.Sc.

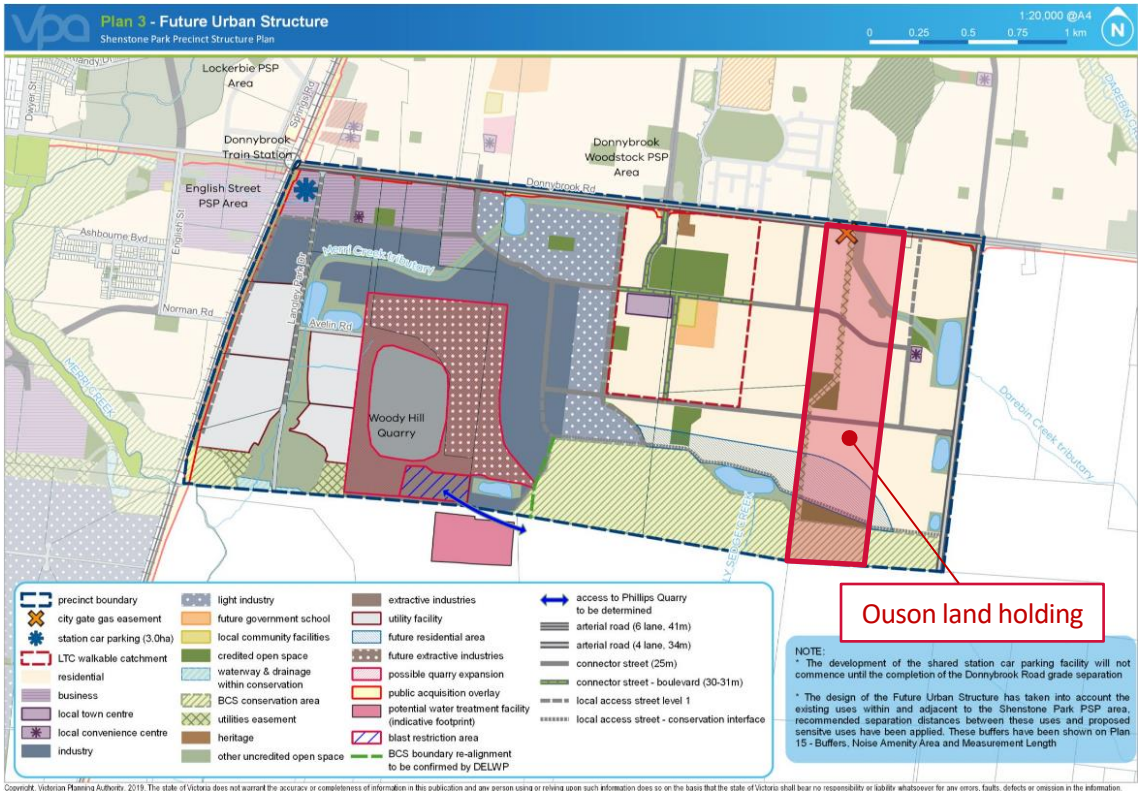
3.14 A glossary of acoustic terminology is provided in Appendix C.

4.0 OUSON LAND HOLDING

4.1 The Ouson land holding is located at 1100 Donnybrook Road, Donnybrook.

4.2 Plan 5 of the PSP presenting the proposed Future Urban Structure is reproduced in Figure 1 with the Ouson land holding highlighted.

Figure 1: Future Urban Structure



4.3 As shown in Figure 1, the Ouson land holding is generally identified as residential with the following:

- A City Gate gas facility to the northwest of the site (marked as an orange cross)
- A gas easement running north-south along the western side of the subject site
- Areas of credited and uncredited open spaces
- A Biodiversity Conservation Strategy (BCS) conservation area along the southern portion of the site
- A future residential area to the north of the BCS conservation area.

5.0 PHILLIPS QUARRY

5.1 The proposed Phillips Quarry is located at 430 Summerhill Road, Donnybrook, to the southwest of the Ouson land holding.

5.2 At the time of preparing the GHD Report, limited information was available to assess noise from the Phillips Quarry. As such noise modelling assumptions obtained from the Woody Hill Quarry assessment by GHD were used for predicting noise levels from the Phillips Quarry.

5.3 Hours of operation for the Phillips Quarry as detailed in Section 4.1.2 of the GHD Report as:

- 0700 to 1800 hrs Monday to Friday
- 0700 to 1300 hrs Saturdays.

5.4 As directed by Planning Panels Victoria on 4 September 2020, the following documents detailing the key factual information concerning the Phillips Quarry have been issued:

- Letter dated 2 October 2020 prepared by Barro Group Pty Ltd (the *Barro Letter*)
- *Quarry Statement* prepared by the Victorian Planning Authority.

5.5 Neither documents provide sufficient operational information to accurately predict noise levels from the Phillips Quarry.

5.6 The planning permit (TPP7049001) granted in 1999 has recently been extended specifying that operations must commence no later than 8 July 2024.

5.7 The Quarry Statement indicates that the Barro Group *is preparing a new application for work authority (WA006852)* and that a *draft work plan for WA006852 has not yet been submitted*.

5.8 With respect to the proposed quarrying operations within the Phillips Quarry, the Barro Letter states the following:

> *Attached and marked Annexure 6 (e) (ii) is the current proposed initial staging plan for WA 6852.*
>
> *WA 6852 is expected to commence as soon as the necessary approvals are obtained.*
>
> *The north eastern portion of WA 6852 (represented generally by the perimeter of stages 1A and 1B) is currently intended to be fully extracted first, while the north western portion (represented generally by the perimeter of Stages 1C and 1D) will initially be extracted to a level on which to site the fixed processing plant*

5.9 Annexure 6 (e) (ii) of the Barro Letter (the initial staging plan) is reproduced in Appendix D.

5.10 An earth bund is proposed along the northern boundary of the Phillips Quarry as shown in Annexures 6 (b) (viii), 6 (e) (ii) and 6 (f) of the Barro Letter.

5.11 It is not clear what height relative to the surrounding ground level is proposed for the earth bund as the Barro Letter provides inconsistent information. Annexure 6 (b) (viii) details a height of 8-9 m whereas Annexure 6 (f) shows a height of 7-8 m.

5.12 No earth bunds along the northern boundary of the Phillips Quarry were accounted for in the GHD Report.

6.0 CITY GATE GAS FACILITY

6.1 At the time of preparing my statement, no site layout was available to determine the type of equipment installed at the existing City Gate gas facility located to the northwest of the Ouson land holding.

6.2 Due to the current COVID-19 restrictions, I did not measure existing noise levels from the City Gate gas facility.

6.3 Based on MDA's experience with similar facilities, it is my understanding that this type of facility typically comprises a regulator kiosk, gas regulators a process gas heater and associated piping. This is consistent with the aerial photograph of the area presented in Figure 2.

Figure 2: Aerial photograph of the City Gate gas facility

6.4 When located close to residential areas, typical noise control measures for this type of facility are in the form of noise barriers (typically 2-3 m high and surrounding the facility). It is my understanding that a wire mesh fence is currently installed around the City Gate gas facility.

6.5 A detailed noise assessment would be required to determine the extent of noise mitigation required to achieve compliance with the relevant regulation (SEPP N-1[1]) at the proposed surrounding residential areas.

[1] See Section 8.0

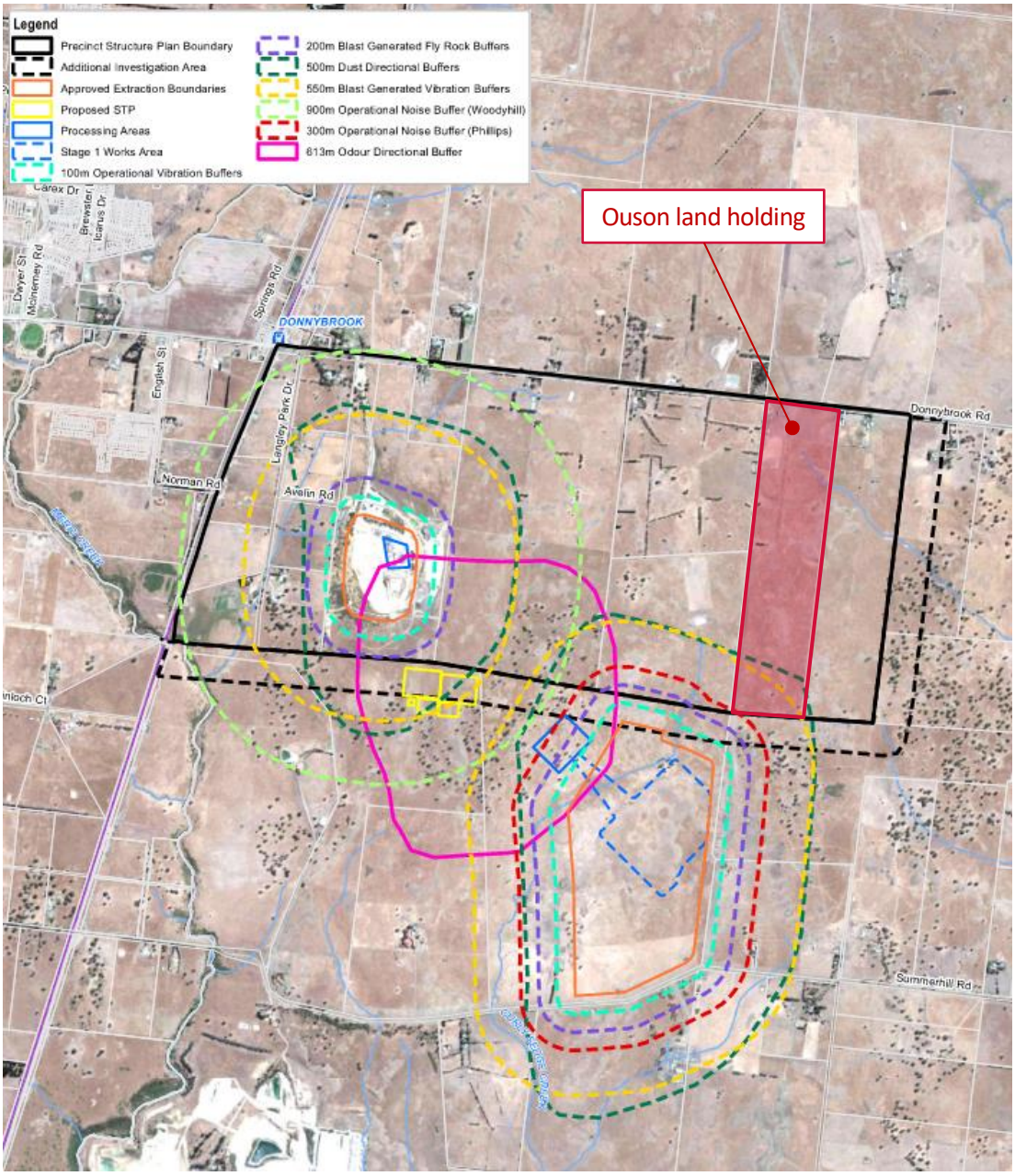
7.0 ACOUSTIC BUFFER

7.1 The Ouson land holding is proposed to be impacted by the following buffers around the proposed Phillips Quarry:

- 200 m blast buffer
- 300 m noise buffer
- 550 m sensitive use buffer (relating to blast generated vibration).

7.2 Figure 32 of Section 14.2 of the GHD Report, reproduced in Figure 3 with the Ouson land holding highlighted, details the recommended buffers around the Phillips Quarry.

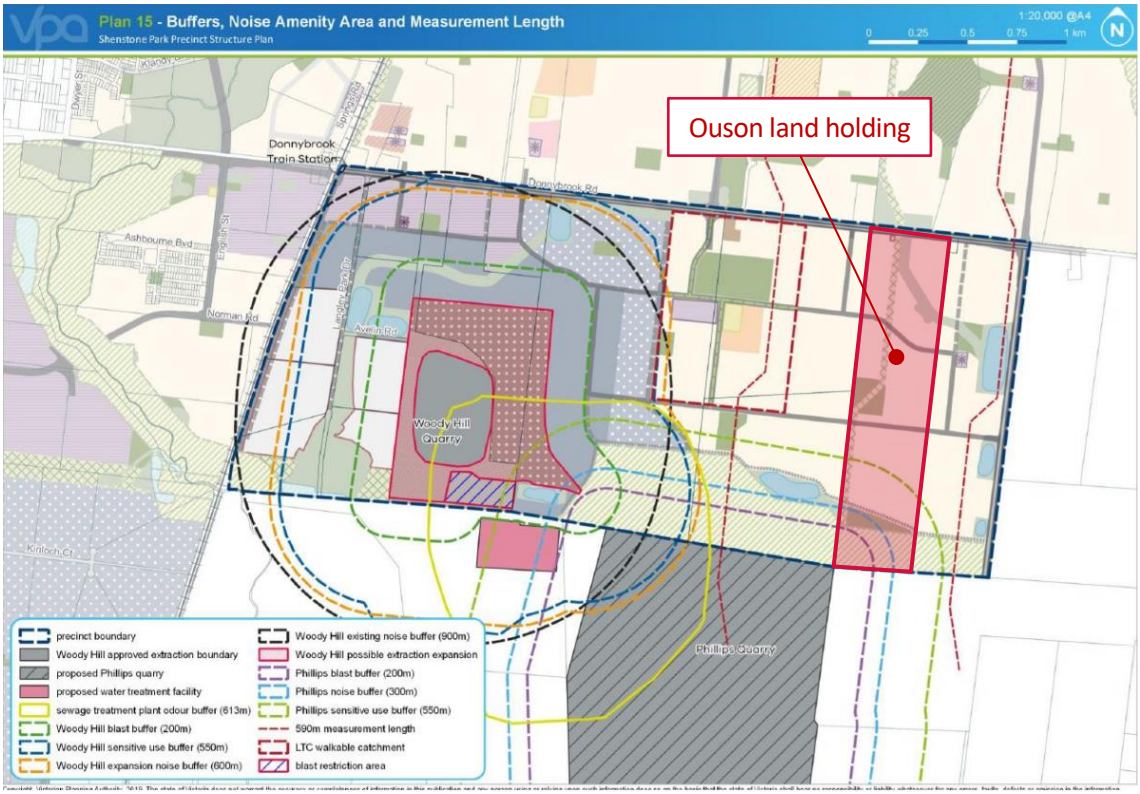
Figure 3: Extract of Figure 32 from the GHD Report



7.3 It can be seen from Figure 3 that the 300 m *Operational Noise Buffer* for the Phillips Quarry (dashed red line) is referenced to the reported extraction boundary and does not impact the Ouson land holding.

7.4 Plan 15 of the PSP is reproduced in Figure 4 with the Ouson land holding highlighted.

Figure 4: Plan 15 of the PSP



7.5 The 300 m *Phillips noise buffer* presented in Plan 15 of the PSP is referenced to the Phillips Quarry property boundary and impacts the southwestern corner of the Ouson land holding.

8.0 NOISE REGULATION

8.1 Within the Melbourne metropolitan area, noise from commercial premises is governed by *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* (SEPP N-1).

8.2 Compliance with SEPP N-1 is mandatory for all commercial premises in the Melbourne metropolitan area under section 46 of the *Environment Protection Act 1970* (Act).

8.3 The limits apply to the total level of noise occurring at sensitive receivers arising from the cumulative effect of noise from all surrounding industrial or commercial premises.

8.4 The noise limits are determined on the basis of land zoning and background noise levels, and are separately defined for day, evening and night periods, as detailed in Table 2.

Table 2: SEPP N-1 time periods

Period	Day	Time
Day	Monday-Friday	0700-1800 hrs
	Saturday	0700-1300 hrs
Evening	Monday-Friday	1800-2200 hrs
	Saturday	1300-2200 hrs
	Sunday/Public Holidays	0700-2200 hrs
Night	Monday-Sunday/Public Holidays	2200-0700 hrs

8.5 SEPP N-1 noise limits are calculated taking into account land 'zoning types' within a 70 m and 200 m radius of a noise sensitive building. An influencing factor is determined from the proportion of zoning types within each circle, categorised as type 1, 2 or 3 as prescribed in EPA Publication 316a[2].

8.6 Land zoning in the vicinity of the Ouson land holding is as follows:

- Urban Growth Zone (UGZ) – area to the northeast of the PSP
- Rural Conservation Zone (RCZ) – area to the south east of the PSP
- Special Use Zone (SUZ4) – Phillips Quarry

8.7 Both the UGZ and RCZ are considered by the EPA as type 1 zoning as they are *residential, rural, open space or similar zones*.

8.8 With respect to SUZ4 in the *Whittlesea Schedule 4 Extractive Industry* zone, EPA Publication 316a states the following for proposed land uses:

> *Where the land is undeveloped for the purpose of the zone, and it is expected that the extractive industry will be fully or partially operational within three years, the land shall be designated Type 3.*
>
> *Where it is expected that the extractive industry will not be fully or partially operational within three years, the land shall be designated Type 1.*

8.9 The noise limits presented in the GHD Report were based on SUZ4 being considered as type 1.

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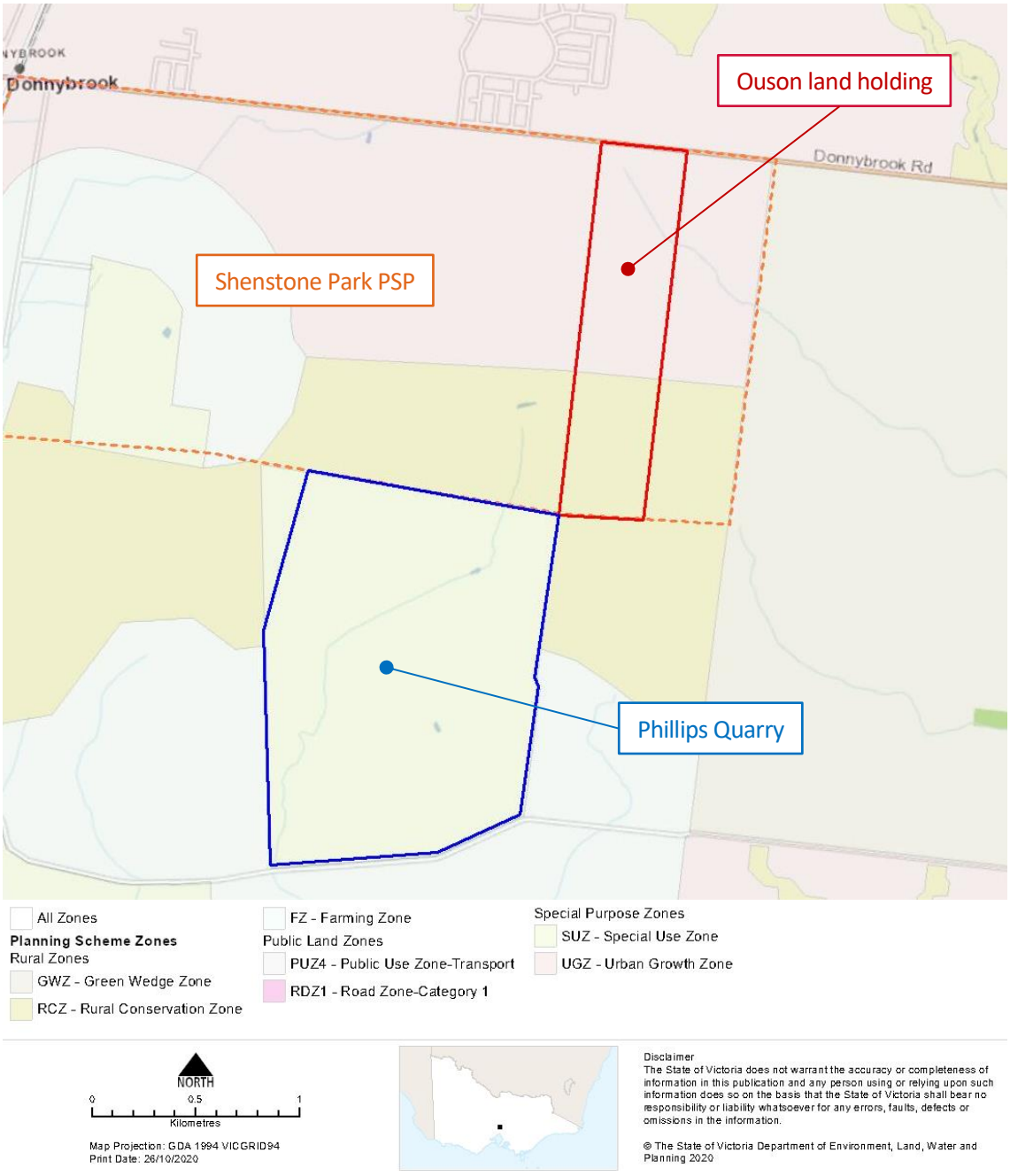
[2] EPA Publication 316a *Designation of Types of Zones and Reservations in the Metropolitan Region Planning Schemes for the Purposes of State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*, dated 17 February 2000

8.10 Considering that the extended planning permit for the Phillips Quarry requires operations to commence by mid-2024, it would be reasonable to assume that the quarry would be at least partially operational within three years. As such, SUZ4 should be considered as type 3 zoning.

8.11 Considering the currently proposed future residential areas are located approximately 300 m from the Phillips Quarry property boundary, the change from type 1 to type 3 for SUZ4 would not alter the applicable noise limits within the Ouson land holding.

8.12 The current land zoning map for the subject area is presented in Figure 5.

Figure 5: Land zoning map



8.13 The SEPP N-1 zoning levels and noise limits presented in Section 8.1.3 of the GHD Report are summarised in Table 3.

Table 3: SEPP N-1 zoning levels and noise limits from GHD Report, dB L_{eff}

Period	Zoning level	Noise limit
Day	55	48
Evening	48	40
Night	43	37

8.14 The noise limits presented in Table 3 have been derived based on zoning levels and background noise levels presented in Section 5.8.5 of the GHD Report.

8.15 Significant variations in background noise level were measured during the survey period for each of the SEPP N-1 periods. The lowest measured noise levels were used to provide a conservative assessment (ie. lower noise limits).

8.16 Considering the proposed developments within the PSP, background noise levels are expected to increase in the future. Such an increase would result is an increase in applicable noise limits.

8.17 Due to the current COVID-19 restrictions, I did not measure background noise levels within the Ouson land holding.

8.18 The noise buffer presented in the GHD Report was recommended to achieve the SEPP N-1 day-time noise limit beyond the buffer with no other mitigation being implemented within the proposed Phillips Quarry (e.g. earth bund).

9.0 NOISE PREDICTIONS

9.1 A 3-dimensional digital model of the Phillips Quarry and surrounding area has been created using SoundPlan proprietary noise modelling software (version 8.2).

9.2 The noise model has been used to calculate noise levels in accordance with ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation* (ISO 9613). ISO 9613 is a general environmental noise calculation standard that has been used extensively throughout Australia, New Zealand and Europe since its publication in 1996.

9.3 The noise model considers the following critical inputs:

- Topographical data representing the current landform of the Phillips Quarry and surrounding areas sourced from the VicPlan Spatial Datamart website
- Simplified topographical data representing the future landform and surrounding footprint based on the proposed initial staging plan
- Equipment types and associated noise levels per the GHD Report and, where deemed necessary, supplemented with Australian or British Standards data and noise measurements undertaken by MDA for similar-sized items of plant
- Future location of fixed and mobile plant and equipment producing noise within the Phillips Quarry per the proposed initial staging plan
- Meteorological conditions that favour noise propagation.

9.4 Stages 1B(i) and 1B(ii) presented in the initial staging plan were deemed to be representative of the quarry stages expected to produce the highest noise levels at the Ouson land holding based on the proximity to the northeast extent of the Phillips Quarry.

9.5 For each stage, the three (3) following scenarios have been considered:

1. No noise mitigation
2. 8 m high earth bund along northern boundary as drawn in the proposed initial staging plan
3. 8 m high earth bund along northern boundary as drawn in the proposed initial staging plan, with an additional 8 m high earth bund extended 320 m along the eastern boundary

9.6 Key assumptions regarding the noise model inputs are summarised in Appendix E.

9.7 Sound power data used in the model are detailed in Appendix F.

9.8 Predicted noise contours for each of the modelled scenarios are presented in Figure 6 to Figure 11, showing the SEPP N-1 day-time noise limit as a red line. Compliance with SEPP N-1 is achieved in areas beyond the red line.

Figure 6: Stage 1B(i), no earth bund

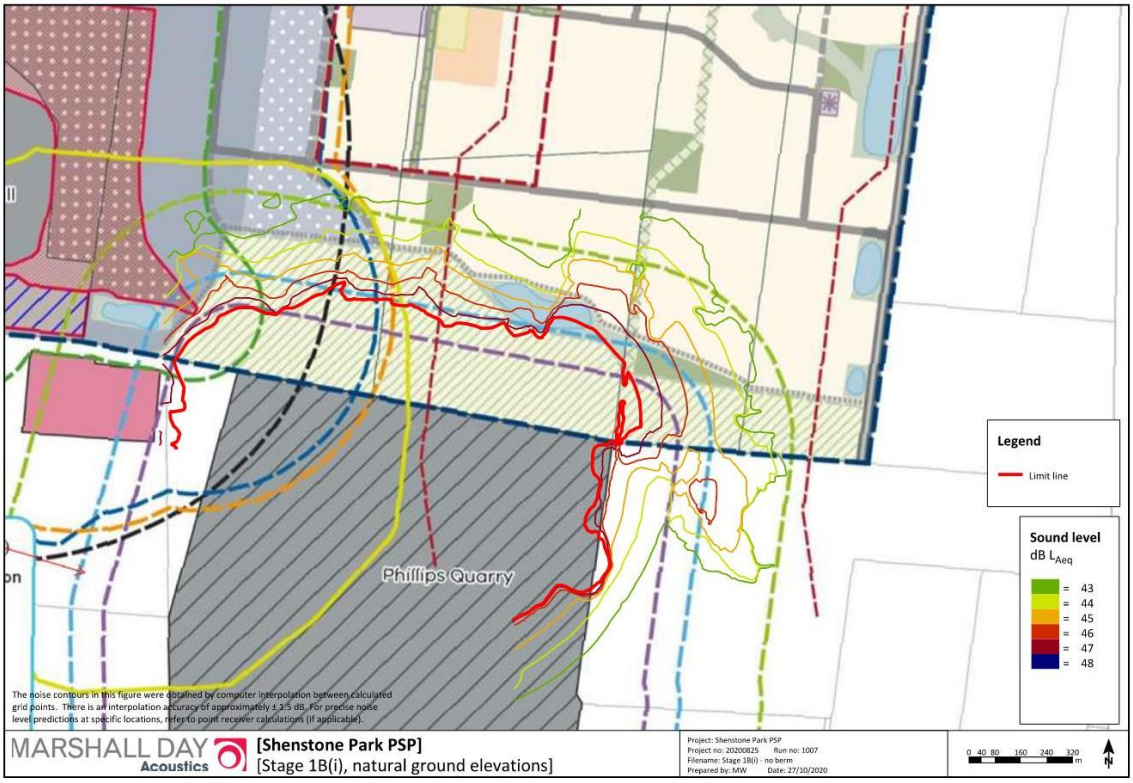


Figure 7: Stage 1B(i), 8 m high earth bund along northern boundary

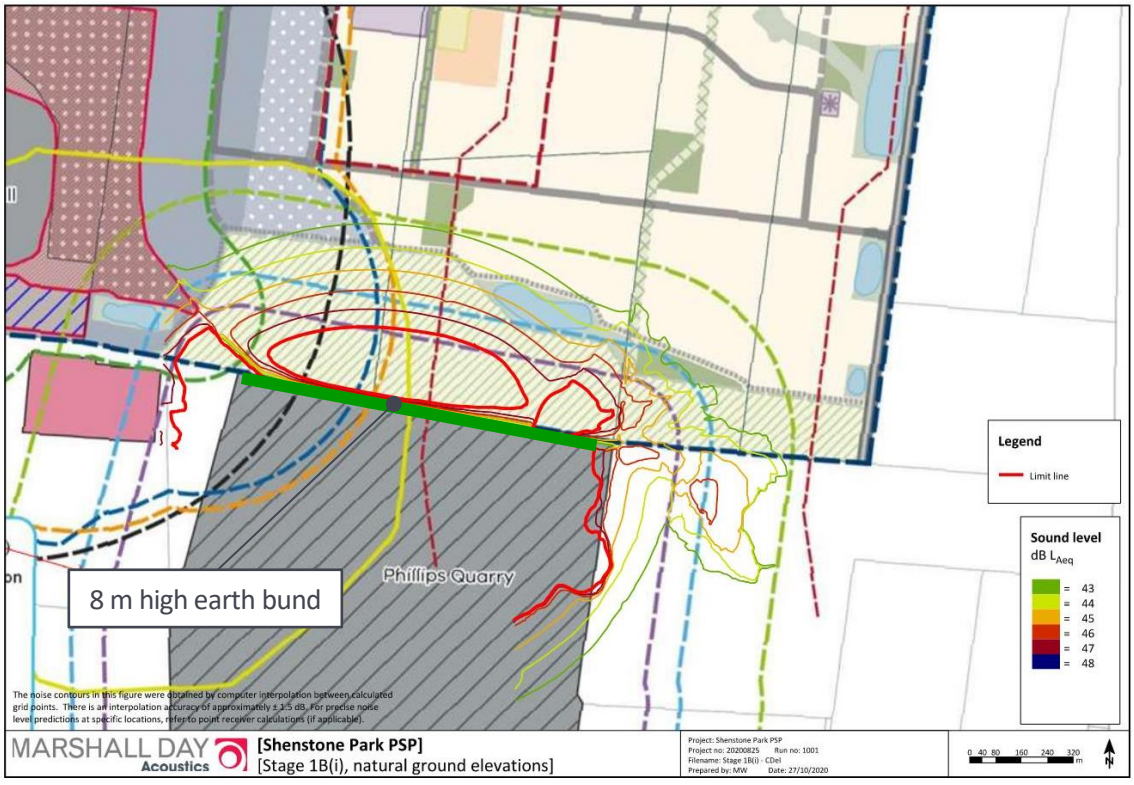


Figure 8: Stage 1 B(i), 8 m high earth bund along northern boundary and eastern boundary

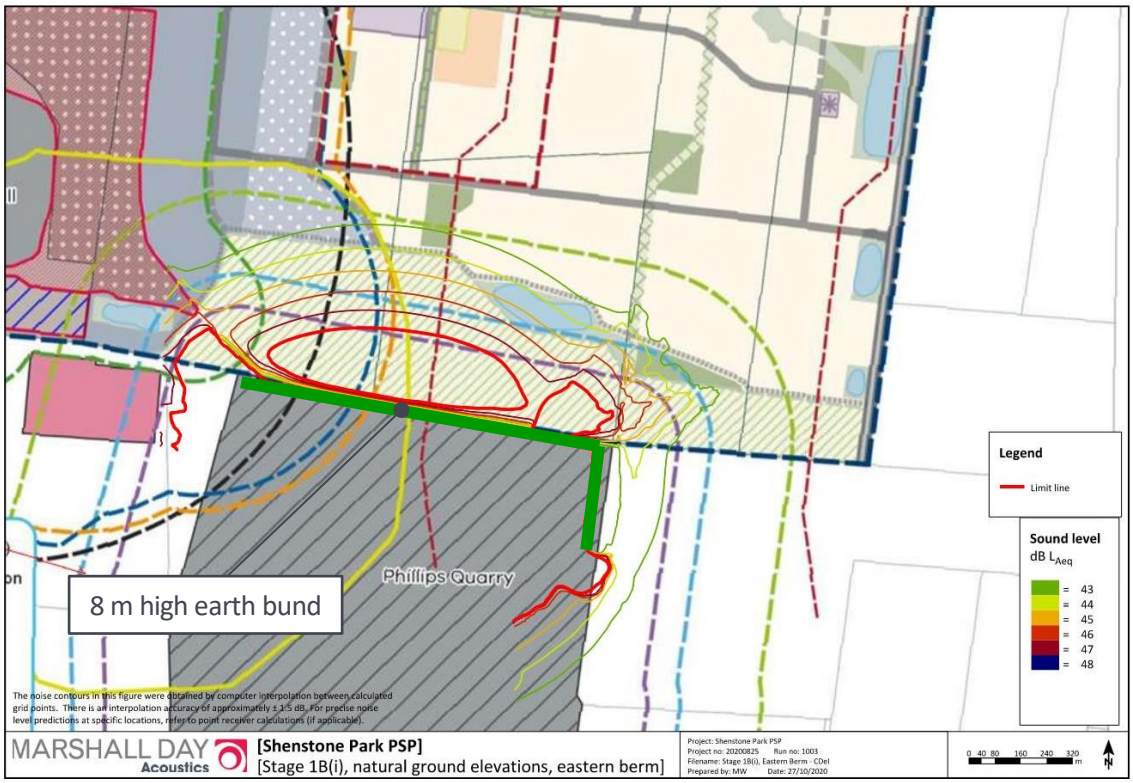


Figure 9: Stage 1B(ii), no earth bund

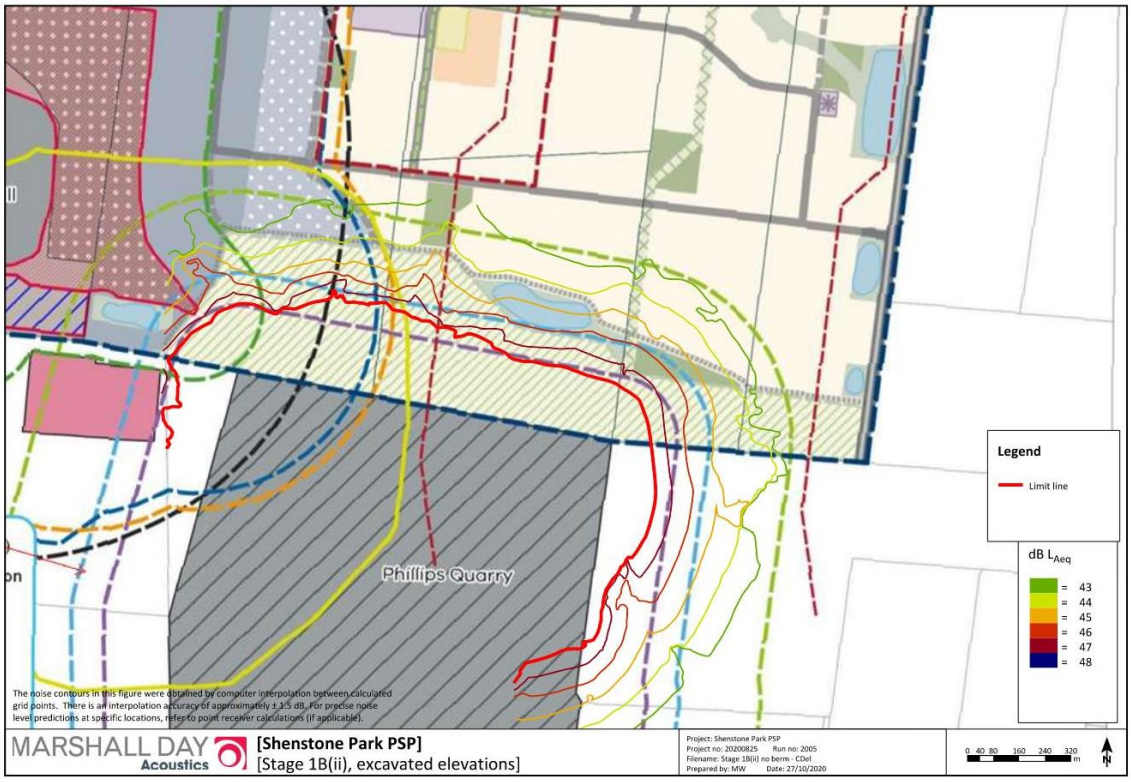


Figure 10: Stage 1B(ii), 8 m high earth bund along northern boundary

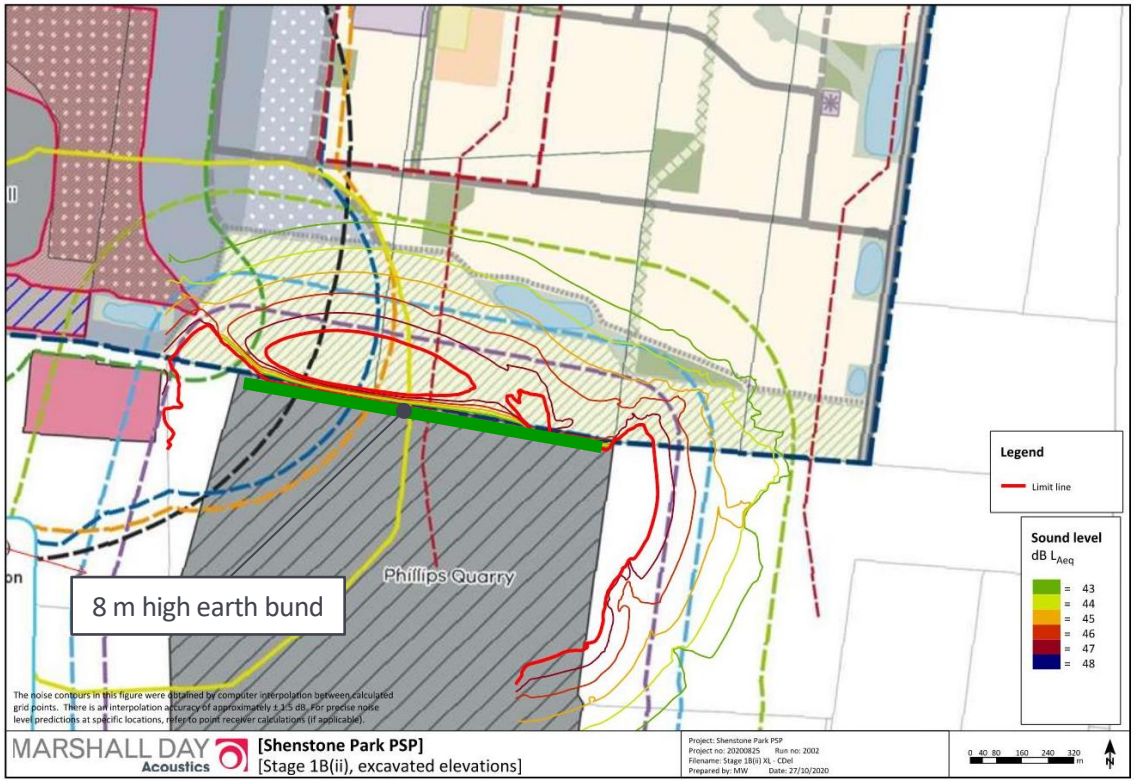
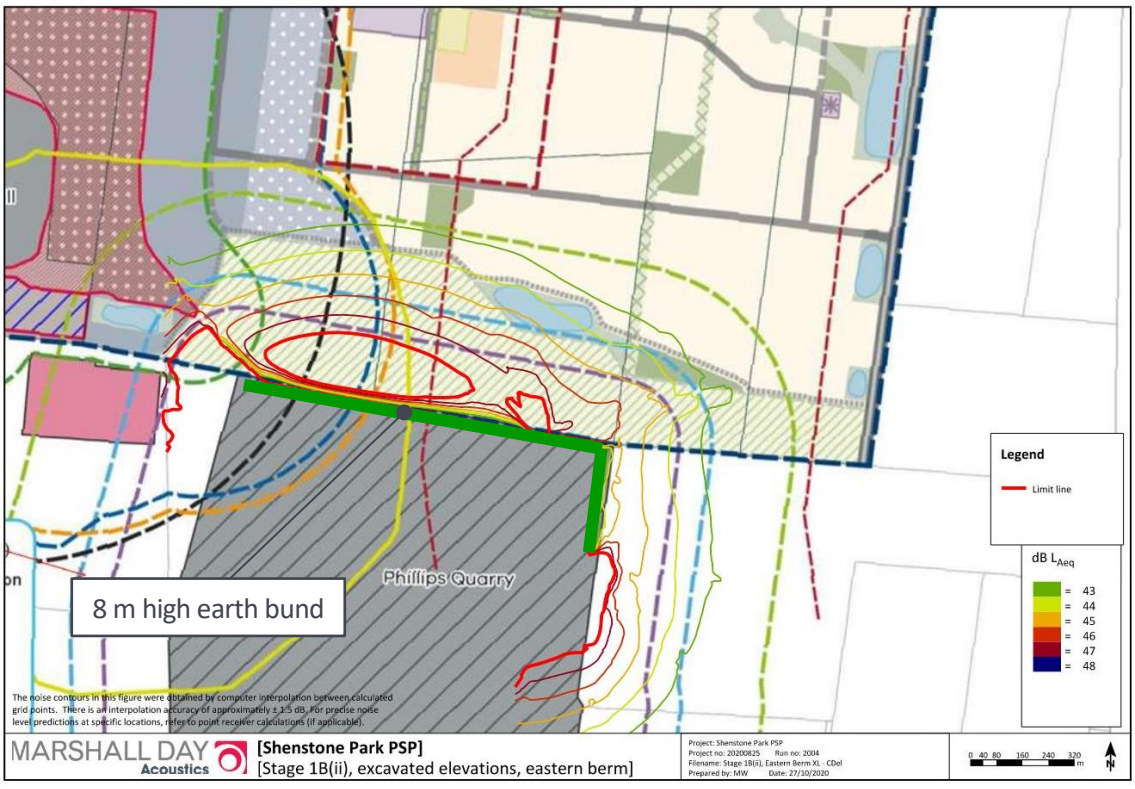


Figure 11: Stage 1B(ii), 8 m high earth bund along northern boundary and eastern boundary



10.0 SUMMARY OF OPINION

10.1 Predicted noise contours presented in the preceding section demonstrate the following:

- Compliance with the day-time SEPP N-1 noise limit can be achieved within 100-200 m of the Phillips Quarry property boundary without the use of noise mitigation measures (see Figure 9)
- Reasonable and feasible noise mitigation measures, such as the proposed earth bund, can be implemented at the Phillips Quarry to achieve the day-time SEPP N-1 noise limit throughout the Ouson land holding (see Figure 11).

10.2 It is my opinion that the 300 m noise buffer proposed in the PSP is not required to protect residential areas within the Ouson land holding from noise generated by the proposed Phillips Quarry.

10.3 As part of the Work Authority application for the proposed Phillips Quarry, a detailed noise assessment should be undertaken demonstrating compliance with the applicable SEPP N-1 noise limits at the proposed future residential areas identified within the PSP. The assessment should also include monitoring of background and ambient noise levels for a minimum period of two (2) weeks.

10.4 It is my opinion that, based on MDA's experience with similar facilities, compliance with SEPP N-1 at adjacent residential properties can be achieved with the installation of a noise barrier around the existing City Gate gas facility.

11.0 DECLARATION

11.1 I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Planning Panel.

Signed.....

Dated 28 October 2020

APPENDIX A CURRICULUM VITAE – CHRISTOPHE FREDERIC DELAIRE

CHRISTOPHE FREDERIC DELAIRE
Co-CEO, Marshall Day Acoustics, Melbourne, Australia

Master's Degree in Engineering (French equivalent), France 2001

Membership	Member of the Australian Acoustical Society, (MAAS)
Project Experience	Christophe Delaire graduated with a Masters Degree in Engineering (French equivalent) from Ecole Supérieure d'Ingénieurs de Poitiers (France) in 2001 and joined Marshall Day Acoustics the following year. Christophe has acquired wide-ranging experience in environmental projects and residential developments. He has particularly developed his skill set in environmental acoustics and has been involved in the noise assessment of numerous extractive industry projects and wind farms. Christophe has given evidence at many hearings (VCAT and Panels Victoria) and is the author of several papers presented at International Wind Turbine Noise Conferences.
Employment	
2017 - Present	Co-CEO, Marshall Day Acoustics, Melbourne
2002 - Present	Associate, Marshall Day Acoustics, Melbourne
2001	Vacation employment, Marshall Day Acoustics, Melbourne

APPENDIX B DOCUMENTS TAKEN INTO ACCOUNT

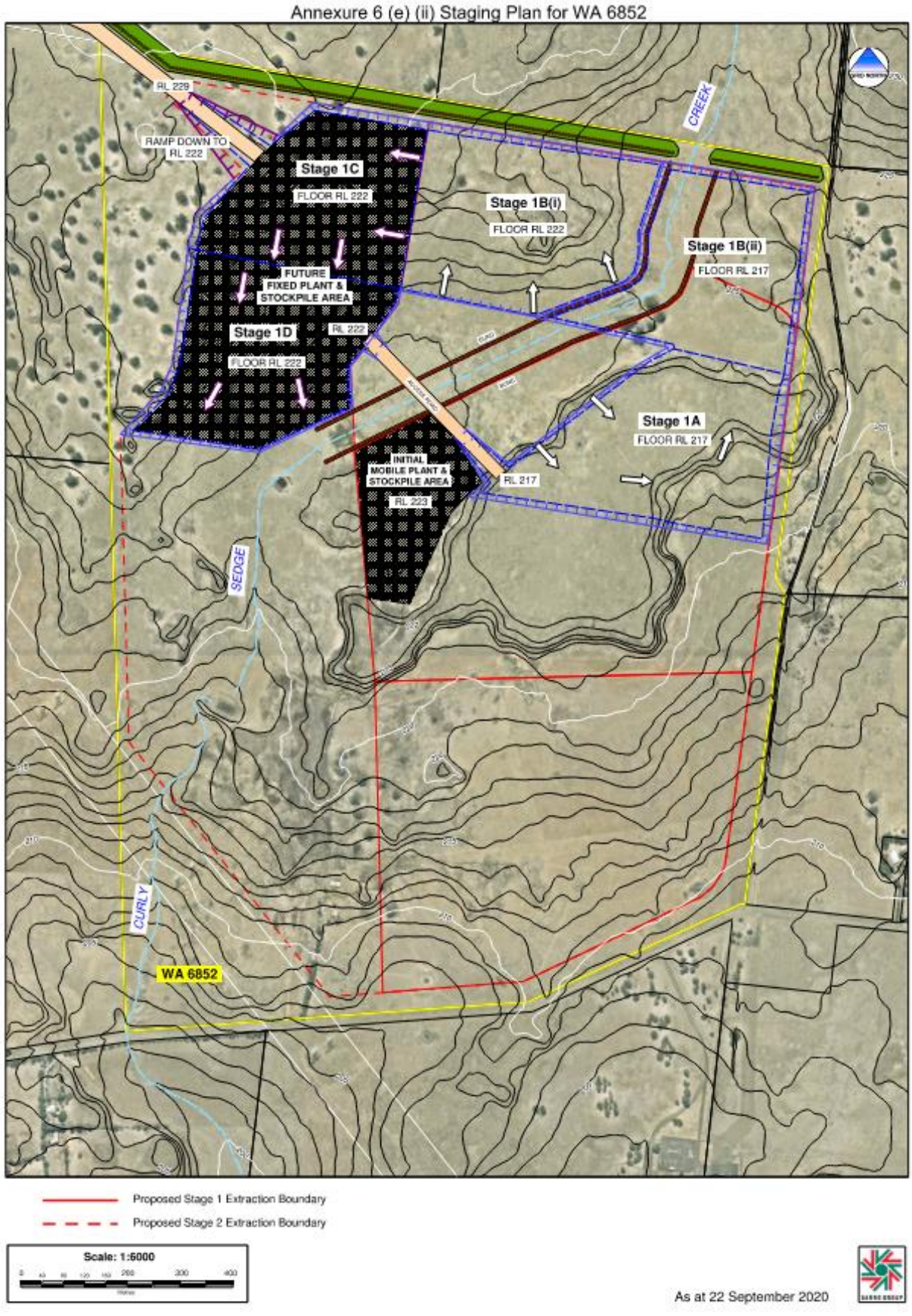
I have reviewed the following documents to the extent necessary to prepare this statement of evidence:

- *Shenstone Park Precinct Structure Plan* dated September 2019
- *Shenstone Park Precinct Structure Plan* dated October 2020
- GHD report Ref 313 5311 *Impact Assessment Report for the Shenstone Park Precinct Structure Plan*, dated December 2017
- Letter dated 2 October 2020 prepared by Barro Group Pty Ltd
- *Quarry Statement* prepared by the Victorian Planning Authority
- *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*
- EPA Publication 316a *Designation of Types of Zones and Reservations in the Metropolitan Region Planning Schemes for the Purposes of State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1*, dated 17 February 2000
- ISO-9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*

APPENDIX C GLOSSARY OF TERMINOLOGY

dB	Decibel The unit of sound level.
A-weighting	The process by which noise levels are corrected to account for the frequency response of the human ear.
Hertz (Hz)	Vibration can occur over a range of frequencies extending from the very low, such as the rumble of thunder, up to the very high such as the crash of cymbals. The frequency of vibration and sound is measured in hertz (Hz). Once hertz is one cycle per second. Structural Vibration is generally measured over the frequency range from 1 Hz to 500 Hz (0.5 kHz).
L_{A90}	The A-weighted noise level equalled or exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.
L_{Aeq}	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.
L_{eff}	The effective noise level of commercial or industrial noise determined in accordance with *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1* (SEPP N-1). This is the L_{Aeq} noise level over a half-hour period, adjusted for the character of the noise. Adjustments are made for tonality, intermittency and impulsiveness.

APPENDIX D CURRENT PROPOSED INITIAL STAGING PLAN FOR WA 6852



APPENDIX E NOISE MODEL INPUT DATA AND ASSUMPTIONS

Feature	Description
Site terrain data	For Stage 1B(i): sourced from Victoria State Government Department of Environment, Land, Water and Planning Spatial Datamart, presumed all activities at natural ground level For Stage 1B(ii): as for Stage 1B(i), except active quarry face at RL 217, per proposed initial staging plan presented in Appendix D
Surrounds terrain data	Sourced from Victoria State Government department of Environment, Land, Water and Planning Spatial Datamart
Environmental ground conditions	Site and surrounding ground is assumed to be 50 % 'hard ground', accounting for light vegetation and earthen terrain
SEPP N-1 adjustments	None, per GHD Report
Site plan	Per proposed initial staging plan
Equipment schedule	Per GHD Report
Buildings on site	N/A, no on-site buildings modelled
Dwelling height	N/A, no dwellings modelled
Receiver height	1.5 m above ground
Noise calculation method	Noise propagation calculated according to ISO 9613-2:1996
Description of proposed activities on site	Per GHD Report
Noise mitigation measures	Scenario 1: no mitigation Scenario 2: 8 m high bund at north of site as pictured in proposed initial staging plan Scenario 3: 8 m high bund extended along the eastern boundary of the quarry for 320 m
Noise data for quarry equipment	Sourced from GHD Report and supplemented with data from AS 2436:2010 and BS 5228-1:2009 and measurement data, where available
Vehicle speeds	Grader moving at 5 km/h, all other vehicles moving at 10 km/h
Truck schedules	1.5 third-party trucks per hour, per GHD Report
Plant operating height	Per GHD Report, reproduced in Appendix F
Operating durations	Fixed plant: continuous operation Mobile plant: continuous operation Third party trucks: 1.5 movements per hour per GHD Report

APPENDIX F SOUND POWER LEVEL DATA, dB L_W

				Octave Band Centre Frequency, Hz							
Noise source	**Height of noise source, m**	**Noise data source**	**Plant number/ Quantity**	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**A**
Primary crusher	6 m	GHD Report	1	115	114	111	107	108	106	101	113
Secondary crusher	6 m	GHD Report	1	115	114	111	107	108	106	101	113
Open conveyor L_w/m	2 m (lowest point) 6 m (highest point)	GHD Report	4*	80	81	81	83	77	72	63	83
Screener	2	GHD Report	2	110	107	104	103	103	101	97	108
Stacker/reclaimer	6	GHD Report	1	98	103	100	97	94	92	89	100**
Concrete batching plant	10	GHD Report	1	106	103	111	111	107	106	98	113
Mobile power crusher and screener	3	GHD Report	1	101	103	102	101	97	95	92	103
Loader	2.5	GHD Report	5	105	108	111	112	108	105	103	114
Haul truck	4	GHD Report	1.5 movements per hour	123	121	117	114	111	109	104	117
Grader	2.5	GHD Report	1	111	113	113	106	99	102	99	110
Excavator	2.5	GHD Report	2	113	106	105	105	101	99	96	107
Truck and dog	3	MDA database noise level based on AS 2436 and BS 5228	1.5 movements per hour	121	112	108	107	105	102	99	110

Noise source	Height of noise source, m	Noise data source	Plant number/ Quantity	Octave Band Centre Frequency, Hz 63	125	250	500	1k	2k	4k	A
Water cart truck	2.5	MDA database noise level based on AS 2436 and BS 5228	1	121	118	112	109	105	104	95	112
Concrete mixer truck	2.5	MDA database noise level based on AS 2436 and BS 5228	1.5 movements per hour	112	103	96	102	101	106	97	109

* Number not stated in GHD Report, based on aerial imagery of existing Woody Hill quarry

** The GHD Report states the sound power level for the stacker/reclaimer as 108 dB L_{WA}, however the spectral noise levels correspond to 100 dB L_{WA}. Spectral noise levels have been used in the noise model.