3.3 DUST MODELLING

3.3.1 DUST MODELLING METHODOLOGY

To enable assessment of dust concentrations and deposition rates from the proposed quarrying operations, detailed dispersion modelling has been conducted using the CALMET / CALPUFF modelling system.

The CALMET / CALPUFF modelling system considers 3-dimensional unsteady state meteorology and is suitable for modelling pollutant transport on a regional scale and for complex terrain and coastal zones. The CALMET / CALPUFF modelling system simulates the effects of spatially and time varying meteorology on pollutant transport within the model domain, including chemical transformation and removal. CALPUFF considers emissions as a series of puffs that, if emitted at a sufficient frequency, simulate a continuous emission. This representation of the plume as a series of puffs allows the pollutant transport to vary spatially across the model domain in accordance with the 3-dimensional meteorological field.

A site-specific 3-dimensional prognostic meteorological dataset generated using TAPM was processed using the CALMET program to provide meteorological inputs in a form suitable for the CALPUFF dispersion model. The terrain and land use resolution was refined to a 100 metre grid for the CALMET / CALPUFF modelling to ensure a reasonable representation of the terrain at the locality. CALMET prepares 3-dimensional meteorological data for each hour of the CALPUFF run based upon the 3-dimensional prognostic dataset generated using TAPM.

The CALMET / CALPUFF model was set up to model dispersion within a 6km x 6km area surrounding the subject site and surrounding sensitive uses. The topography of the subject site and surrounding area was sourced from Queensland Government 5 metre resolution lidar. A gridded receptor resolution of 20 metres was used over the modelling domain considering the separation of the quarry from surrounding sensitive uses.

Emissions estimation and CALPUFF dispersion modelling has been undertaken for the upper limit extraction and production rate of 100,000 tonnes per annum.

The dust modelling has considered the following operating scenarios:

Scenario 1 – Worst Case Continuous Dozer Operation

- Extraction by dozer conservatively represented as operating continuously during the operating hours[6].
- Production rate of 100,000 tonnes per annum from the site
- Crushing and screening plant centrally located on the subject site.
- Full extraction area footprint exposed to wind erosion.

[6] Noting the rock drill extraction emits lesser particulate emissions than dozer extraction

Scenario 2 – More Realistic Dozer Operating Hours

- As per Scenario 1, but with dozer operations more realistically represented as occurring **6 hours per day**.

Particulate concentrations and deposition rates have been assessed at representative discrete receptors as shown on **Figure 2**. Gridded receptor modelling has also been undertaken to produce contours of the predicted dust concentrations and deposition rates over the model domain.

The model-predicted dust concentrations and deposition rates due to emissions from the proposed quarrying activities were added to the ambient concentrations presented in **Table 6** above to assess the cumulative dust exposure at surrounding receptors.

In order to assess the potential dust deposition from the quarry it was necessary to model a particle size distribution. Whilst the actual particle size distribution of various sources and materials does vary, it is considered reasonable to apply a generalised particle size distribution for the purposes of this modelling. The modelled particle size distribution was derived from the following data included in the USEPA AP42 Chapter 13.2.4 *Aggregate handling and Storage Piles*[7]:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 µm	< 15 µm	< 10 µm	< 5 µm	< 2.5 µm
0.74	0.48	0.35	0.20	0.053[a]

[a] Multiplier for < 2.5 µm taken from Reference 14.

A detailed summary of the particle size distributions input to the TSP, PM_{10} and $PM_{2.5}$ models is provided as **Attachment 3**.

7 USEPA (2006) Compilation of Air Pollutant Emission Factors – Volume 1: Stationary Point and Area Sources, AP-42 Chapter 13.2.4 Aggregate Handling and Storage Piles, United States Environmental Protection Agency.

3.3.2 METEOROLOGICAL DATA

No site-specific meteorological data was available for this assessment. In the absence of site-specific data, following accepted methodology for assessment, the TAPM software was utilised to develop a prognostic meteorological model which generated a year of representative hourly meteorological data for the locality.

TAPM has been used to predict meteorological parameters specific to the area surrounding the subject site including temperature, wind speed, wind direction and stability classification. The model accesses databases of surface characteristics (terrain height, soil and vegetation) and synoptic weather analyses provided by CSIRO to carry out these analyses. TAPM is able to process the output data to produce meteorological data files suitable for input to the CALMET / CALPUFF modelling system i.e. a 3-dimensional grid of hourly varying meteorological parameters over a full year.

Technical discussion of the model algorithms, inputs and model validation studies are provided in the Part 1: Technical Paper (Hurley, 2002) and Part 2: Summary of Verification Studies (Hurley *et al*, 2002)[8,9].

The centre coordinates for the model grid were Latitude -26°14' and Longitude 151°58'. The following nested model grids were applied to the TAPM modelling:

40 x 30 km grid (total area 1200 km x 1200 km)
40 x 10 km grid (total area 400 km x 400 km)
40 x 3 km grid (total area 120 km x 120 km)
40 x 1 km grid (total area 40 km x 40 km)

Twenty-five vertical grid levels were modelled.

The TAPM model was set up to generate a site-specific meteorological data file for the locality, based upon synoptic analysis data for the representative Year 2020, as provided by CSIRO.

The nearest Bureau of Meteorology (BoM) meteorological station to the subject site is 40 kilometres away at Kingaroy. Considering the large seperation distance and surrounding terrain features, assimilation data was not included into the TAPM model.

[8] Hurley, P.J. (2002) The Air Pollution Model (TAPM) Version 2: User Manual. Aspendale: CSIRO Atmospheric Research Internal Paper.

[9] Hurley, P.J. (2002) The Air Pollution Model (TAPM) Version 2: Part 1: Technical Description. Aspendale: CSIRO Atmospheric Research Technical Paper.

The TAPM output was processed using the CALTAPM software to produce a 3-dimensional data file suitable for input to the diagnostic CALMET model as an 'initial guess field'. The CALMET model further resolved the prognostic meteorology to a finer terrain, land use and soil type resolution of 100 metres over a 6 x 6 km area covering the subject site and surrounding region for the purpose of dispersion modelling.

Analysis of the CALMET derived meteorology for the subject land including a wind rose, wind frequency graph, monthly average temperatures graph and tabulated stability class analysis is contained in **Attachment 4**.

3.3.3 DUST CONTROL MEASURES

It is recommended that the following dust control measures are implemented at the quarry:

- **Watering of haul road, access road and stockpile area** at a rate of up to 2 litres/m^2/hour as required to manage emissions from unsealed roads and the stockpile area, especially during dry and/or windy conditions;
- **Water sprays to processing plant** at transfer points, at a minimum;
- **Rock drill to have an appropriate dust extraction system** with collector fitted to rig and/or wet drilling via water sprays; and
- Management of dust emissions from stockpiles during high wind speed conditions through appropriate **use of sprinklers and/or suitable water truck as required**.

The above dust control measures have been considered in dust emission estimation calculations presented in this report.

3.3.4 DUST EMISSION SOURCES

The following sources were represented in the CALPUFF Model:

- Access Road Entrance (paved) as a series of area sources;
- Access Road (unpaved) as a series of area sources;
- Mobile Plant operation as an area source;
- Pit Operations including Dozer operation as an area source;
- Loading Mobile Plant and Product Stockpiles as an area source;
- Loading from Stockpiles to trucks as an area source;
- Wind Erosion from unsealed areas as area sources; and
- Drilling as an area source;

Dust emissions from each of these sources have been represented in the CALPUFF model as area or volume sources with appropriate locations, sizes and initial dispersion parameters to represent the releases.

Emissions rates for each of the above sources have been calculated using published emission factors from the following references:

- NPI *Emission Estimation Technique Manual for Mining v3.1*, Environment Australia (2012);
- USEPA AP42 Chapter 13.2.2 *Unpaved Roads* (2006);
- USEPA AP42 Chapter 13.2.1 *Paved Roads* (2002);
- USEPA AP42 Chapter 11.19.2 *Crushed Stone Processing and Pulverized Mineral Processing* (2004); and
- USEPA AP42 Chapter 13.2.4 *Aggregate Handling and Storage Piles* (2006).

Emission rates have been estimated based upon the upper limit production rate of 100,000 tonnes per annum and distributed for each source across the proposed operating hours.

In accordance with the method presented in the NPI *Emission Estimation Technique Manual for Mining v3.1*, wind erosion emissions have only been represented when wind speed is greater than a 5.4m/s threshold.

Detailed emission rate calculations for quarrying operations are included as **Attachment 5**.

3.3.5 DUST MODELLING RESULTS

Summaries of the model-predicted dust concentrations and deposition rates at the representative sensitive receptors (refer **Figure 2**) are provided in **Table 7** and **Table 8**.

Results are presented for the following two scenarios:

Scenario 1: Worst Case Continuous Dozer Operation

Scenario 2: More Realistic Dozer Operating Hours

The predicted concentrations at the representative receptors from quarry operations include the ambient concentrations presented in **Table 6** above.

Other residential dwellings within the model domain (refer **Figure 2**) are noted to be no more affected than the selected representative receptors.

Table 7: **Model-Predicted Dust Exposures for Worst Case Continuous Dozer Operation including ambient**

RECEPTOR (refer Figure 2)	PM_{10}		$PM_{2.5}$		TSP	DUST DEPOSITION
	$\mu g/m^3$		$\mu g/m^3$		$\mu g/m^3$	$mg/m^2/day$
	Maximum 24-hour average	Annual Average	Maximum 24-hour average	Annual Average	Annual Average	Maximum Monthly Average
R1	33.0	19.0	9.8	5.9	38.4	51.4
R2	37.4	19.3	10.8	6.0	39.3	54.7
R3	30.4	18.4	9.3	5.8	36.9	43.4
R4	28.6	18.3	8.8	5.7	36.7	42.4
R5	26.7	18.3	8.4	5.7	36.6	41.9
R6	28.5	18.3	8.8	5.7	36.7	41.6
R7	23.1	18.2	7.6	5.7	36.5	40.7
R8	32.2	18.4	9.8	5.8	36.9	41.6
R9	35.4	18.6	10.6	5.8	37.4	43.2
R10	28.9	18.6	9.0	5.8	37.4	43.3
R11	27.4	18.7	8.6	5.8	37.6	44.0
R12	23.1	18.4	7.5	5.8	37.0	43.4
R13	23.1	18.5	7.6	5.8	37.2	44.1
R14	25.5	18.6	8.1	5.8	37.4	43.2
Air Quality Objective	**50**	**25**	**25**	**8**	**90**	**120**
Compliance?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Table 8: **Model-Predicted Dust Exposures for More Realistic Dozer Operating Hours including ambient**

RECEPTOR (refer Figure 2)	PM_{10}		$PM_{2.5}$		TSP	DUST DEPOSITION
	$\mu g/m^3$		$\mu g/m^3$		$\mu g/m^3$	$mg/m^2/day$
	Maximum 24-hour average	Annual Average	Maximum 24-hour average	Annual Average	Annual Average	Maximum Monthly Average
R1	26.8	18.6	7.5	5.8	37.5	46.7
R2	29.4	18.8	7.8	5.8	38.0	48.6
R3	25.2	18.3	7.3	5.7	36.6	42.0
R4	24.2	18.2	7.2	5.7	36.5	41.4
R5	23.1	18.2	7.0	5.7	36.4	41.1
R6	24.0	18.2	7.1	5.7	36.4	40.9
R7	21.1	18.2	6.8	5.7	36.3	40.4
R8	25.8	18.2	7.4	5.7	36.6	40.9
R9	27.4	18.4	7.6	5.7	36.8	41.7
R10	24.0	18.4	7.1	5.7	36.8	41.7
R11	23.3	18.4	7.1	5.7	36.9	42.1
R12	21.1	18.3	6.8	5.7	36.6	41.8
R13	21.1	18.3	6.8	5.7	36.7	42.2
R14	22.3	18.4	6.9	5.7	36.8	41.7
Air Quality Objective	**50**	**25**	**25**	**8**	**90**	**120**
Compliance?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

The results of the gridded receptor modelling are presented in **Attachment 6** as contours of predicted dust concentrations and deposition rates over an aerial photograph base. The plotted concentrations / deposition rates include the ambient concentrations specified in **Table 6** above.

The modelling conducted demonstrates that, with the recommended dust control measures (refer **Section 3.3.3**), the proposed quarrying activities can comply with the air quality objectives of the Queensland *Environmental Protection (Air) Policy 2019* at all surrounding residences.

4.0 CONCLUSION

MWA Environmental has been engaged by Roamalla Pty Ltd to prepare a Noise & Dust Impact Assessment in support of an application for a proposed extractive industry use located at Murgon, Queensland.

The report addresses the potential impact of noise and dust emissions from the proposed quarrying activities on sensitive land uses with reference to relevant regulatory noise limits and air quality objectives.

Detailed predictive computer noise modelling of the proposed quarrying activities demonstrates that compliance with the acoustic quality objectives prescribed in the Queensland *Environmental Protection (Noise) Policy 2019* can be achieved at surrounding residences.

It is recommended that the following noise control measures are implemented:

- The **rock drill and dozer are not to operate simultaneously** i.e. only one of either the rock drill or dozer should operate at any one time.
- **Extraction via rock drill or dozer should only be undertaken 7am to 6pm Monday to Friday and 7am to 3pm Saturday i.e. no extraction activities between 6am and 7am**.
- **Crushing and screening should only be undertaken 7am to 6pm Monday to Friday and 7am to 3pm Saturday i.e. no crushing and screening activities 6am and 7am**.
- Where practicable, the **mobile processing plant** is to be located with topographical shielding to the nearest sensitive receptors (e.g. mobile processing plant should be located centrally to the site and on lower levels wherever possible.
- It is recommended that **mobile plant** (e.g. front-end loaders, dozers, excavators) **be fitted with broadband reversing alarms** to mitigate potential nuisance from tonal characteristics of traditional beeper alarms. Stockpile areas should be designed to allow forward-in, forward-out movement of road haulage trucks to avoid a requirement for external trucks to reverse on-site where practical.

Detailed computer dust dispersion modelling of the proposed quarrying activities has demonstrated that compliance with the air quality objectives prescribed in the Queensland *Environmental Protection (Air) Policy 2019* can be achieved at surrounding sensitive receptors with the provision of appropriate dust controls and management measures.

The dust control measures recommended for the quarry to achieve compliance with the regulatory guidelines are:

- **Watering of haul road, access road and stockpile area** at a rate of up to 2 litres/m^2/hour as required to manage emissions from unsealed roads and the stockpile area, especially during dry and/or windy conditions;
- **Water sprays to processing plant** at transfer points, at a minimum;
- **Rock drill to have an appropriate dust extraction system** with collector fitted to rig and/or wet drilling via water sprays; and
- Management of dust emissions from stockpiles during high wind speed conditions through appropriate **use of sprinklers and/or suitable water truck as required**.

In summary, the noise and dust impact assessment has concluded that, with appropriate management measures and physical emission controls, the proposed quarrying activities can comply with relevant noise amenity criteria and air quality objectives at the surrounding sensitive land uses.

MWA Environmental
27 September 2023

FIGURES


Manyung
Murgon
Murgon
Site
Moondooner
Murgon
Bunya Highway
Burtons Road
LEGEND
SITE LOCATION
DRAWING REFERENCE
© THE STATE OF QUEENSLAND
(DEPARTMENT OF RESOURCES)
QLDGLOBE.
0 100 200 300 400 500m
CLIENT
ROAMALLA PTY LTD
C/- GASKELL PLANNING CONSULTANTS
PROJECT
NOISE AND DUST IMPACT ASSESSMENT
EXTRACTIVE INDUSTRY USE
79 ZERNERS ROAD
MURGON QLD
TITLE
SITE LOCATION
JOB MURGON
JOB NO. 22-152
DATE 26/09/23
SCALE 1:15000 (A4)
REV.
FIGURE 1
DWG NUMBER
22-152-1
mwa
ENVIRONMENTAL


Manyung
Murgon
Murgon
Moondooner
Murgon
Site
Burtons Road
Burtons Road
Burtons Road
Burtons Road
Burtons Road
Burtons Road
Burtons Road
Burtons Road
Burnett Highway
Burnett Highway
Burnett Highway
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4
5
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8
9
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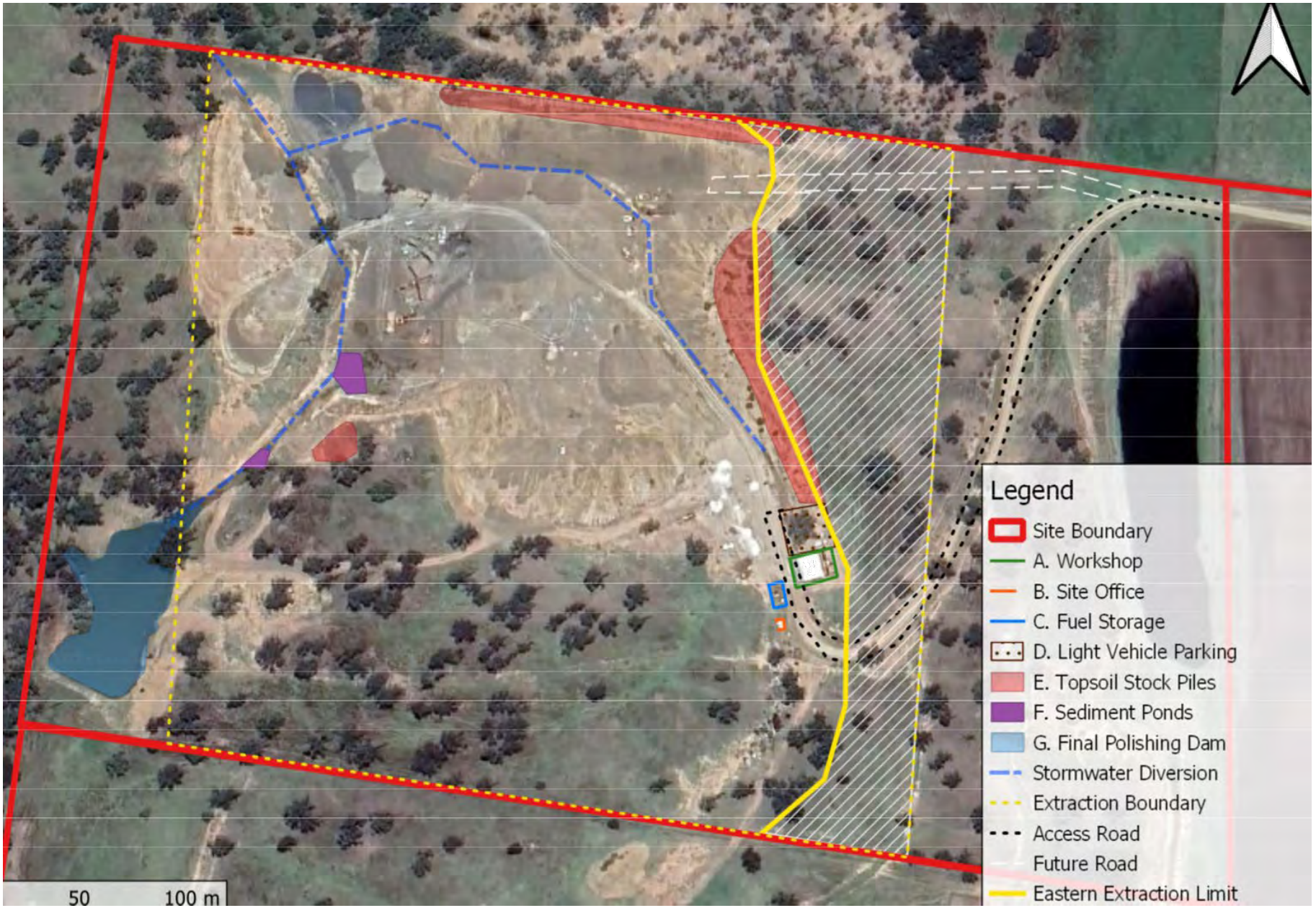
11
12
13
14
LEGEND
SITE LOCATION
R14 NEAREST SENSITIVE RECEPTORS
DRAWING REFERENCE
© THE STATE OF QUEENSLAND (DEPARTMENT OF RESOURCES) QLDGLOBE.
0 100 200 300 400 500m
CLIENT
ROAMALLA PTY LTD
C/- GASKELL PLANNING CONSULTANTS
PROJECT
NOISE AND DUST IMPACT ASSESSMENT
EXTRACTIVE INDUSTRY USE
79 ZERNERS ROAD
MURGON QLD
TITLE
SENSITIVE RECEPTOR LOCATIONS
JOB MURGON
JOB NO. 22-152
DATE 26/09/23
SCALE 1:15000 (A4)
REV.
FIGURE 2
DWG NUMBER
22-152-2
mwa ENVIRONMENTAL
Max Winders & Associates Pty Ltd tas MWA Environmental
Level 7, 241 Adelaide St, Brisbane, GPO BOX 3137, Brisbane Qld 4001
P 07 3002 5500 E mail@mwaenviro.com.au
W www.mwaenviro.com.au
ABN 94 076 833 084

ATTACHMENT 1

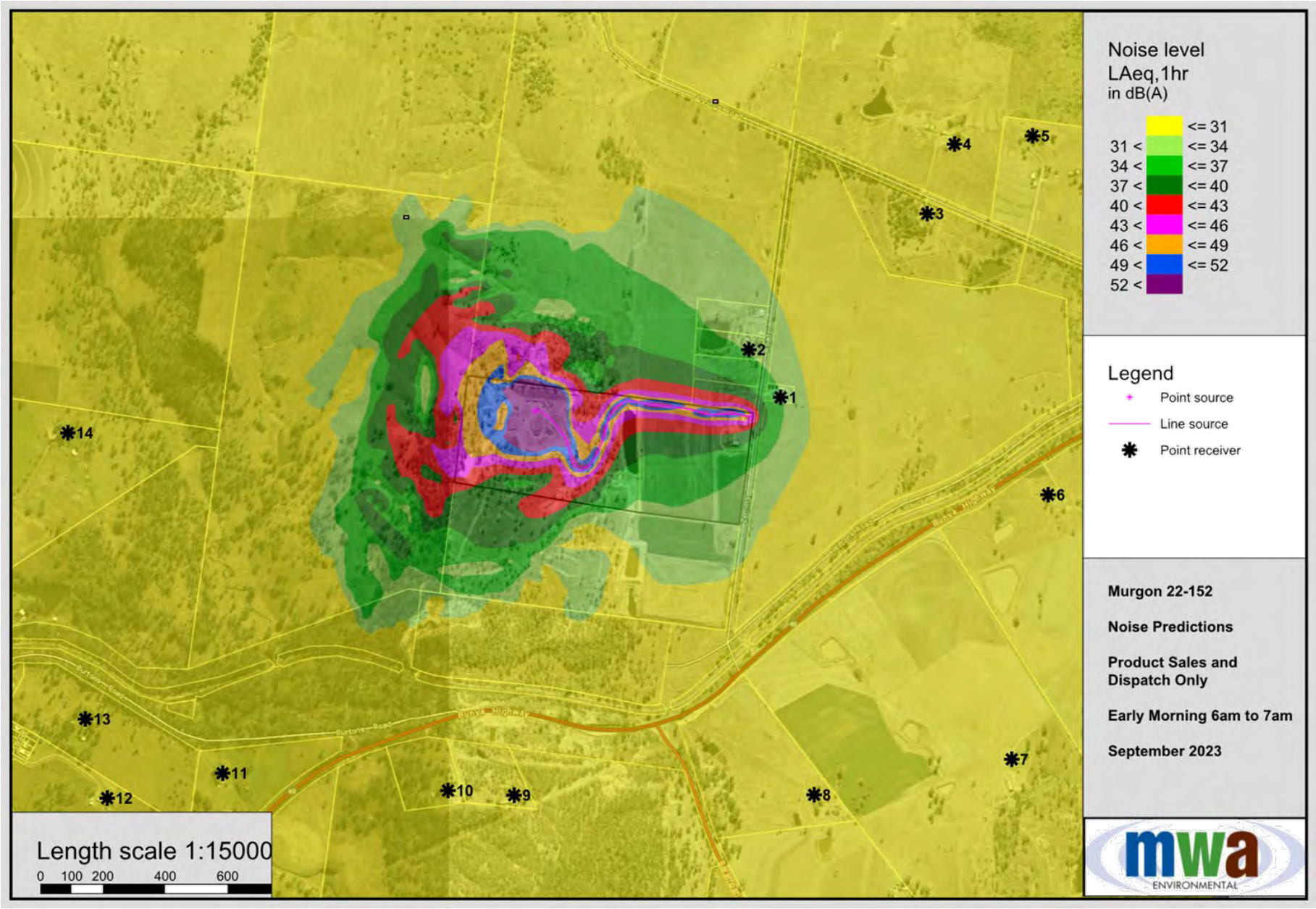
Proposed Quarry Development Plans


Legend
Site Boundary
A. Workshop
B. Site Office
C. Fuel Storage
D. Light Vehicle Parking
E. Topsoil Stock Piles
F. Sediment Ponds
G. Final Polishing Dam
Stormwater Diversion
Extraction Boundary
Access Road
Future Road
Eastern Extraction Limit
50
100 m

ATTACHMENT 2

SoundPLAN 8.2

Noise Predictions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Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Product Sales and Dispatch Only
Early Morning 6am to 7am
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
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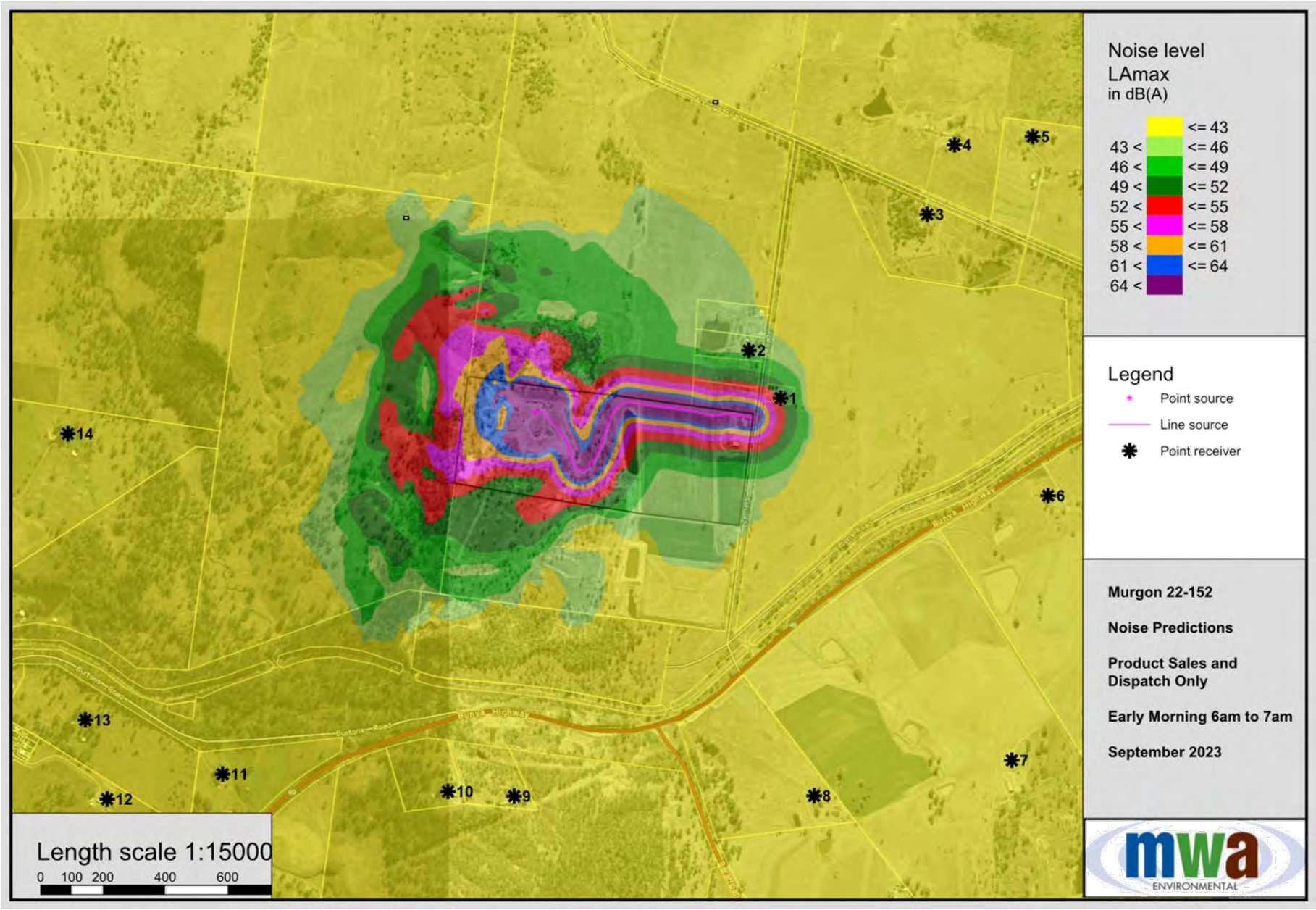
Burtons Road
Bunya Highway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64 <
Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Product Sales and Dispatch Only
Early Morning 6am to 7am
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
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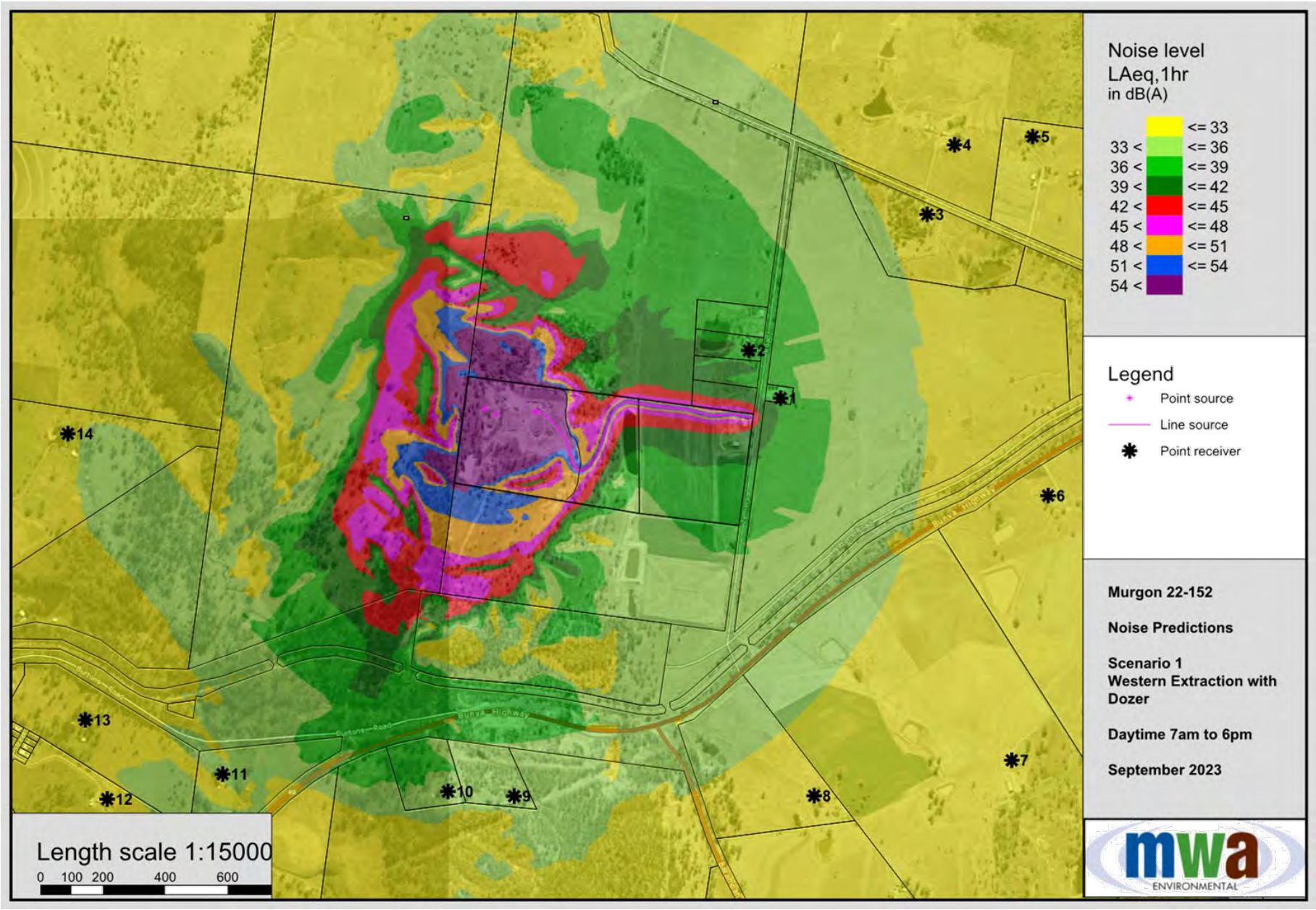
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in dB(A)
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45 < <= 48
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51 < <= 54
54 <
Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 1
Western Extraction with Dozer
Daytime 7am to 6pm
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
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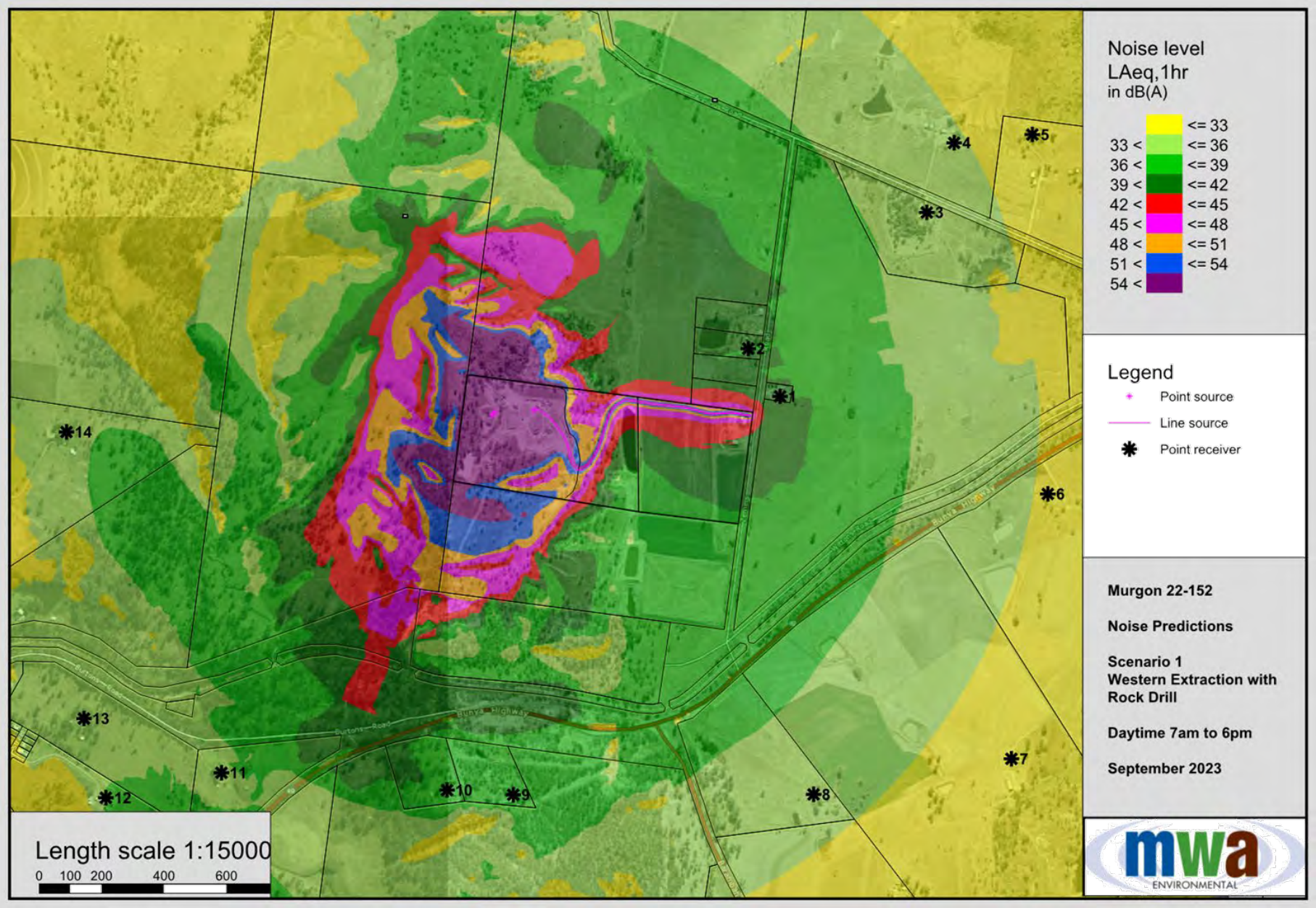
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Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 1
Western Extraction with Rock Drill
Daytime 7am to 6pm
September 2023
Length scale 1:15000
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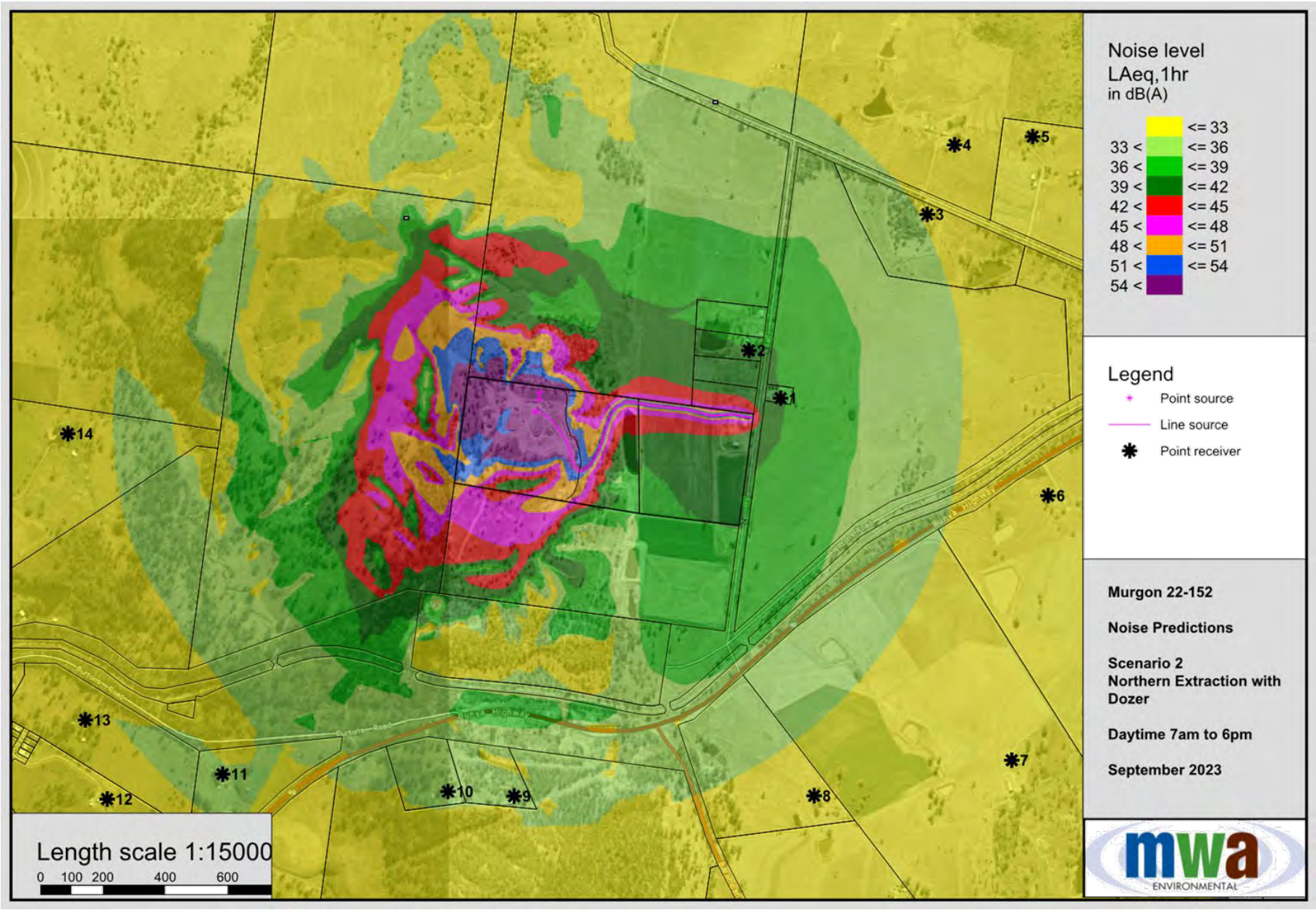
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Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 2
Northern Extraction with Dozer
Daytime 7am to 6pm
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
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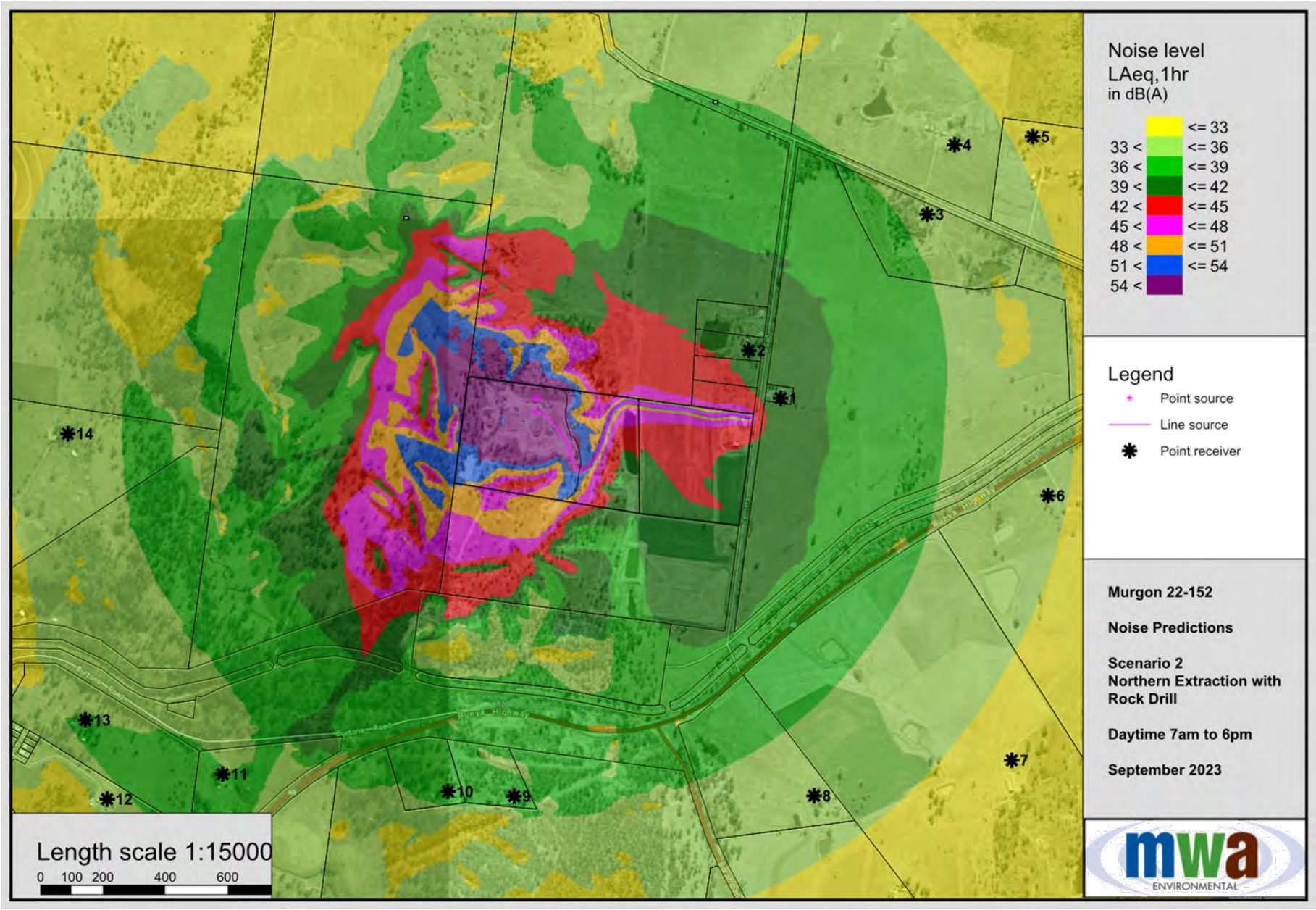
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Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 2
Northern Extraction with Rock Drill
Daytime 7am to 6pm
September 2023
Length scale 1:15000
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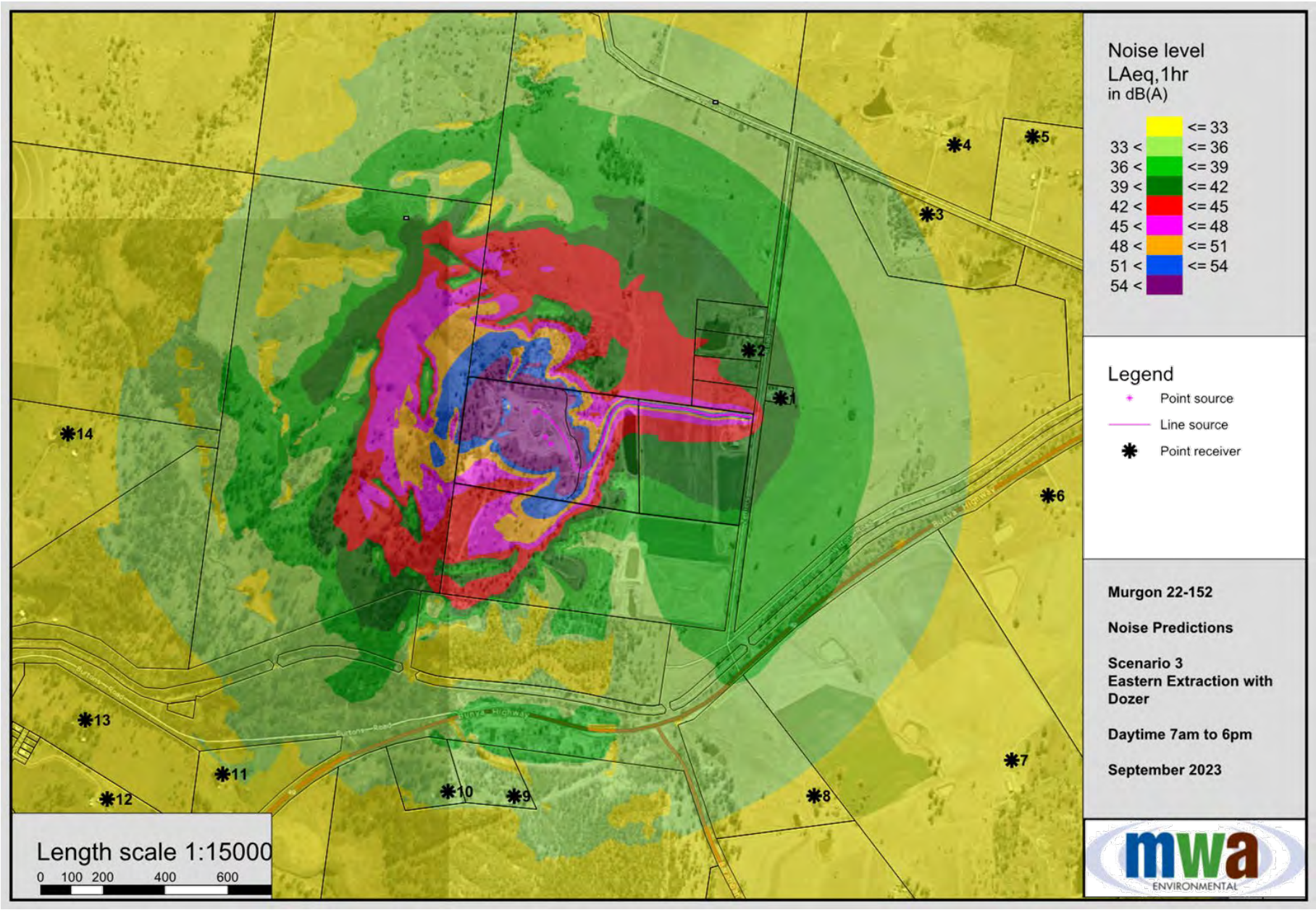
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Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 3
Eastern Extraction with Dozer
Daytime 7am to 6pm
September 2023
Length scale 1:15000
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mwa ENVIRONMENTAL
1
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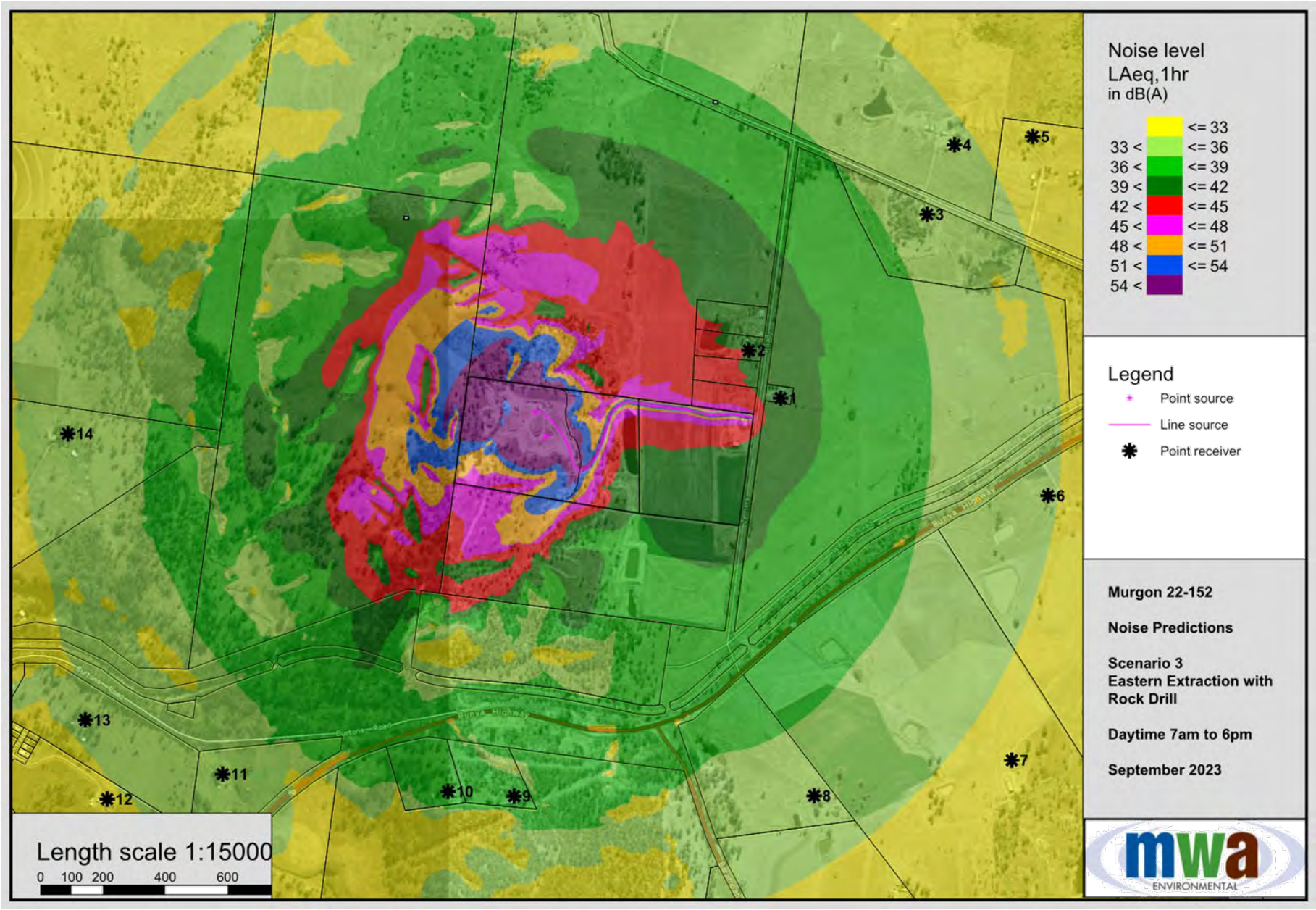
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45 < <= 48
48 < <= 51
51 < <= 54
54 <
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Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 3
Eastern Extraction with Rock Drill
Daytime 7am to 6pm
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
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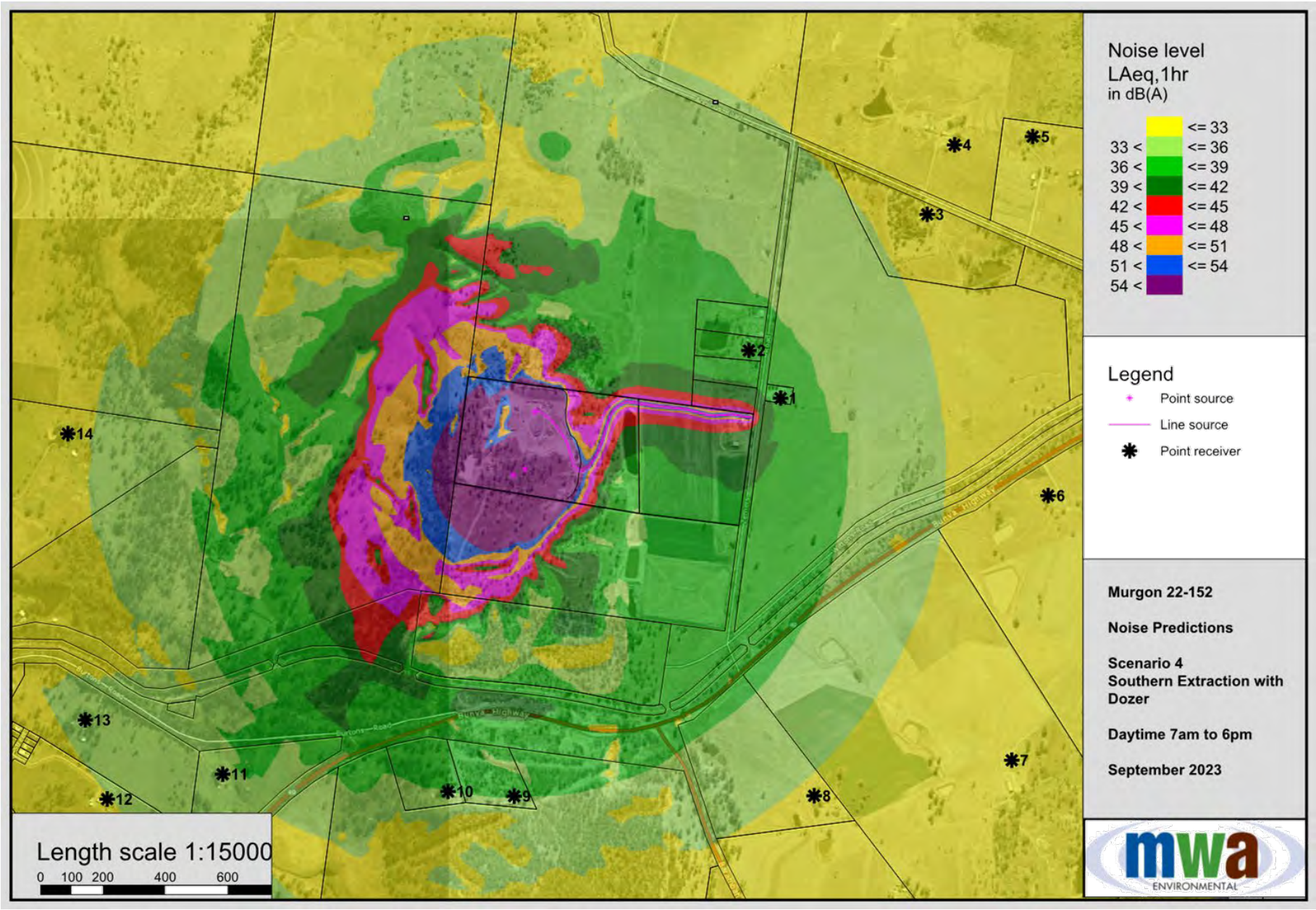
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in dB(A)
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39 < <= 42
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51 < <= 54
54 <
Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 4
Southern Extraction with Dozer
Daytime 7am to 6pm
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
1
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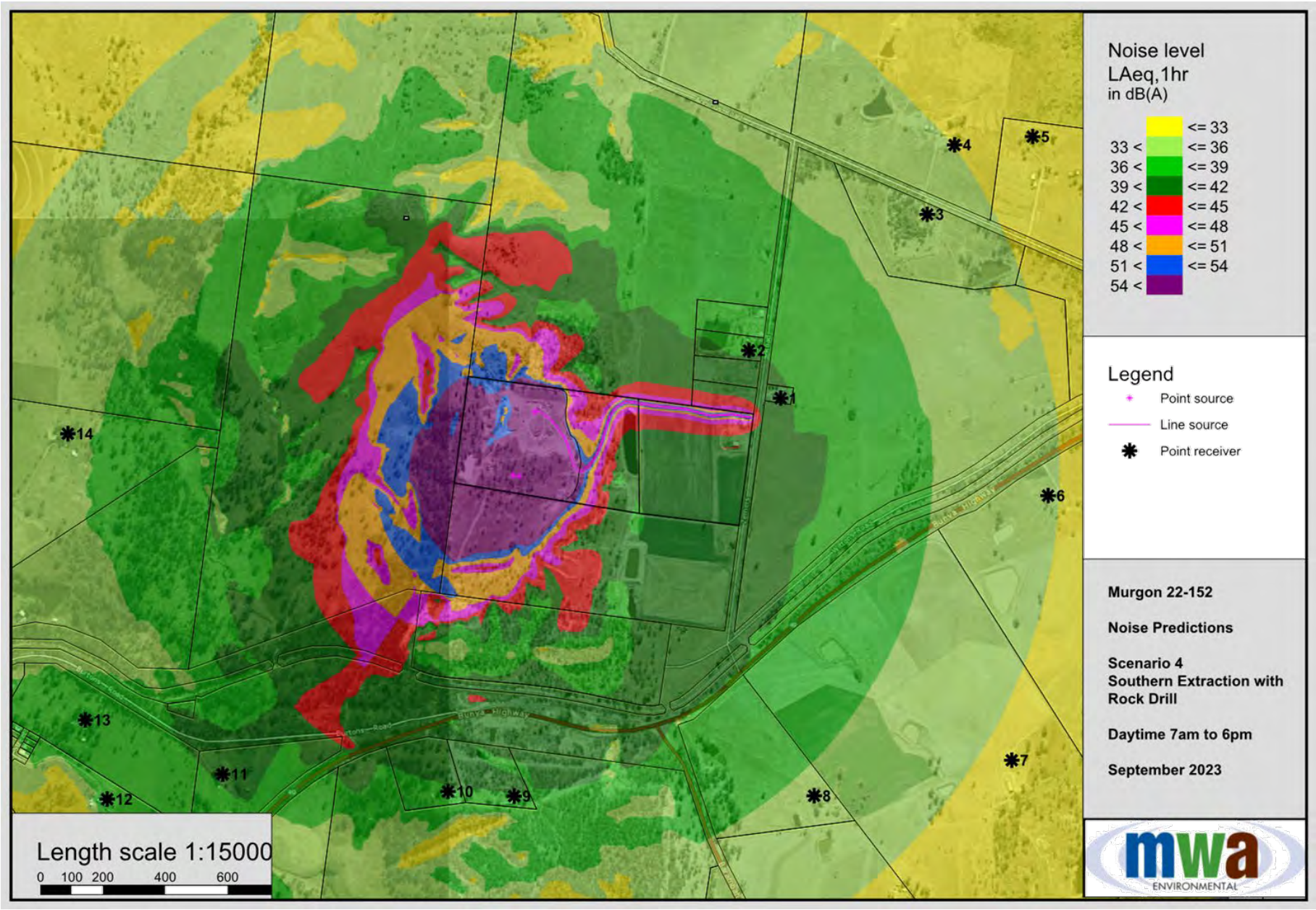
13
14


Noise level
LAeq,1hr
in dB(A)
<= 33
33 < <= 36
36 < <= 39
39 < <= 42
42 < <= 45
45 < <= 48
48 < <= 51
51 < <= 54
54 <
Legend
Point source
Line source
Point receiver
Murgon 22-152
Noise Predictions
Scenario 4
Southern Extraction with Rock Drill
Daytime 7am to 6pm
September 2023
Length scale 1:15000
0 100 200 400 600
mwa ENVIRONMENTAL
1
2
3
4
5
6
7
8
9
10
11
12
13
14

ATTACHMENT 3

Modelled Particle Size Distribution

PARTICLE SIZE DISTRIBUTION

The particle size multiplier in the equation, k, varies with aerodynamic particle size range, as follows:

Aerodynamic Particle Size Multiplier (k) For Equation 1				
< 30 μm	< 15 μm	< 10 μm	< 5 μm	< 2.5 μm
0.74	0.48	0.35	0.20	0.053[a]

[a] Multiplier for < 2.5 μm taken from Reference 14.

TSP

FRACTION #	1	2	3	4	5	6
PARTICLE SIZE (MICRONS)	>30	<30	<15	<10	<5	<2.5
ASSUMED MEAN PARTICLE SIZE (MICRONS)	**40**	**22.5**	**12.5**	**7.5**	**3.75**	**1.25**
% OF TOTAL	**0.26**	**0.26**	**0.13**	**0.15**	**0.147**	**0.053**
STANDARD DEVIATION	**0**	**0**	**0**	**0**	**0**	**0**

PM10

FRACTION #	4	5	6
PARTICLE SIZE (MICRONS)	<10	<5	<2.5
ASSUMED MEAN PARTICLE SIZE (MICRONS)	**7.5**	**3.75**	**1.25**
% OF TOTAL	0.15	0.147	0.053
% OF <PM10	**0.428571**	**0.42**	**0.151429**
STANDARD DEVIATION	**0**	**0**	**0**

PM2.5

FRACTION #	6
PARTICLE SIZE (MICRONS)	<2.5
ASSUMED MEAN PARTICLE SIZE (MICRONS)	**1.25**
% OF TOTAL	0.053
% OF <PM2.5	**100**
STANDARD DEVIATION	**0**

ATTACHMENT 4

Analysis of CALMET-Generated Site Meteorological Data

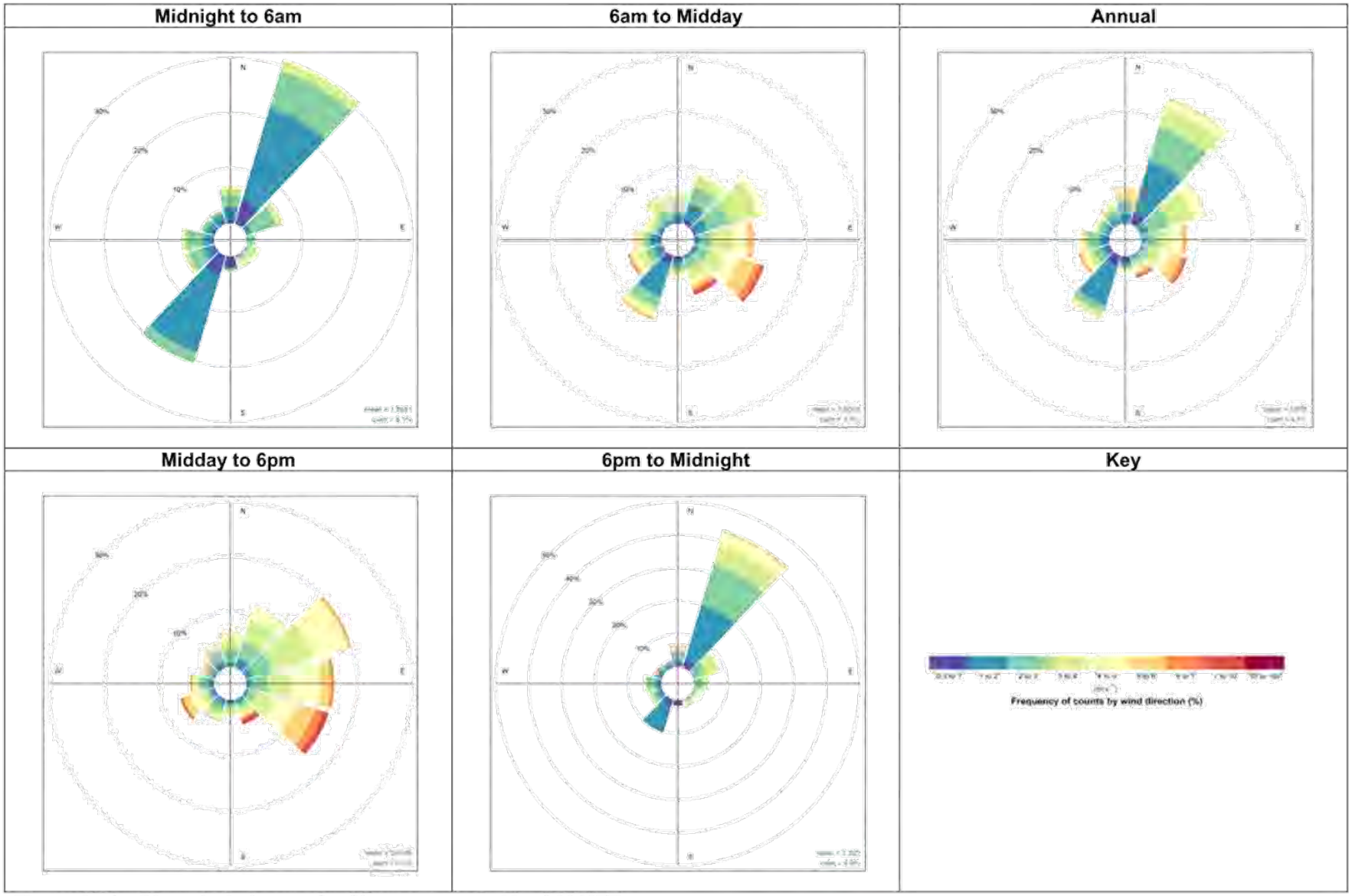


Figure A5.1 Diurnal wind roses for Site as generated by CALMET

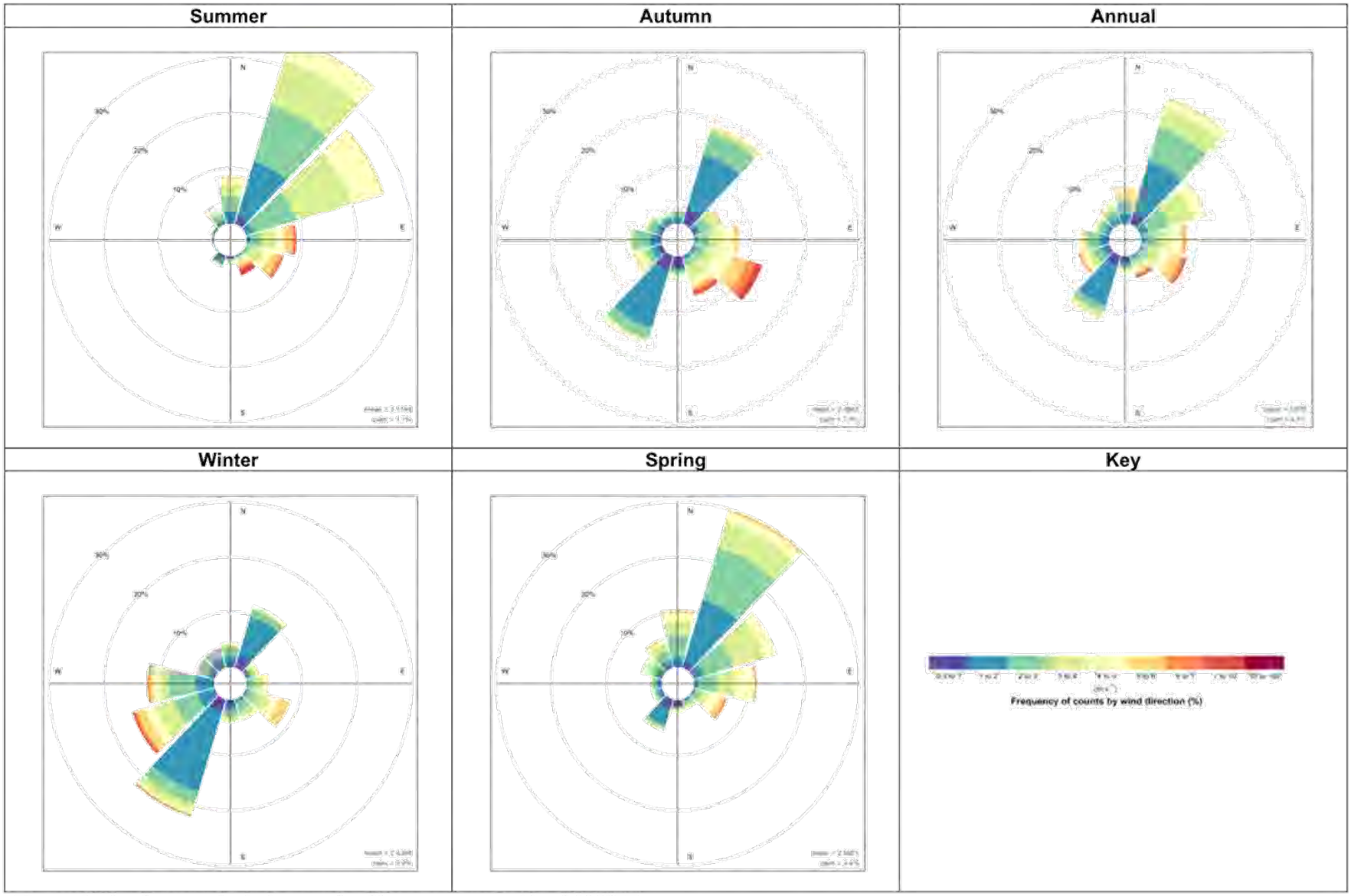


Figure A5.2 Seasonal wind roses for Site as generated by CALMET

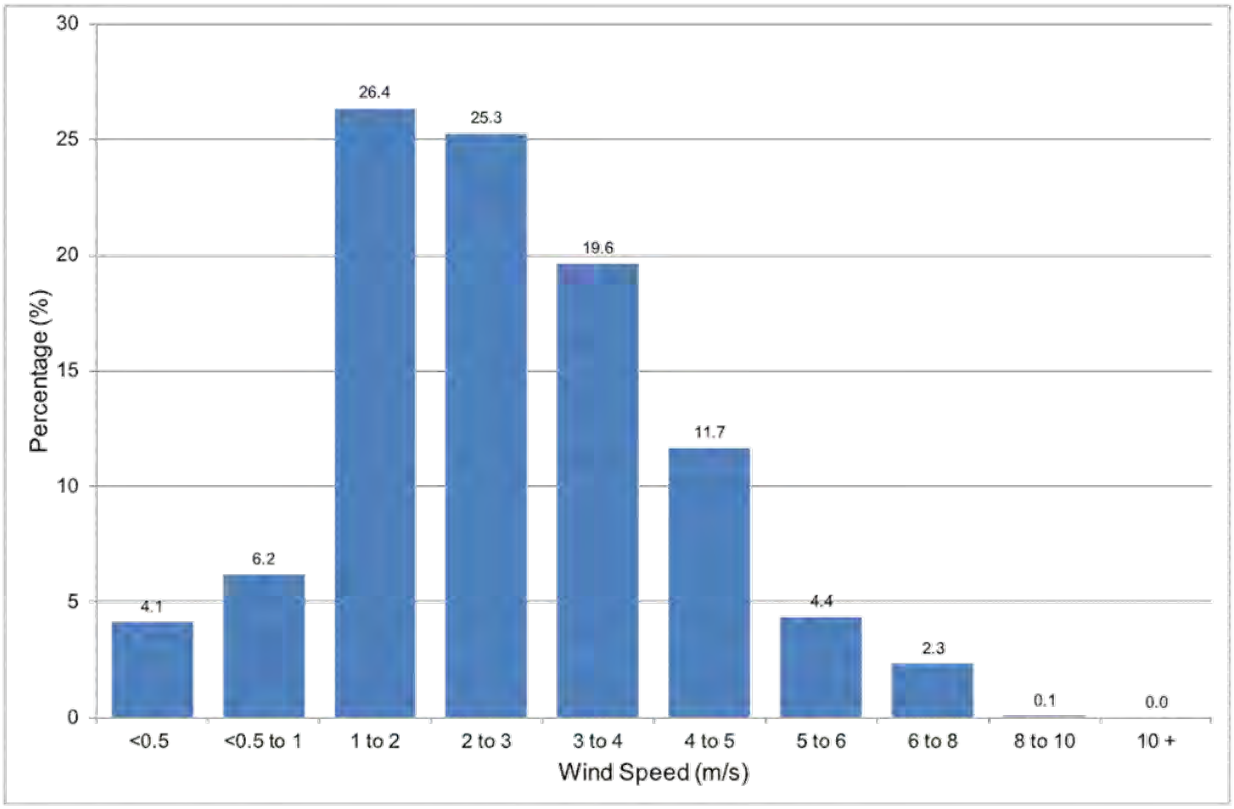


Figure A5.3 Wind frequency graph for Site as generated by CALMET

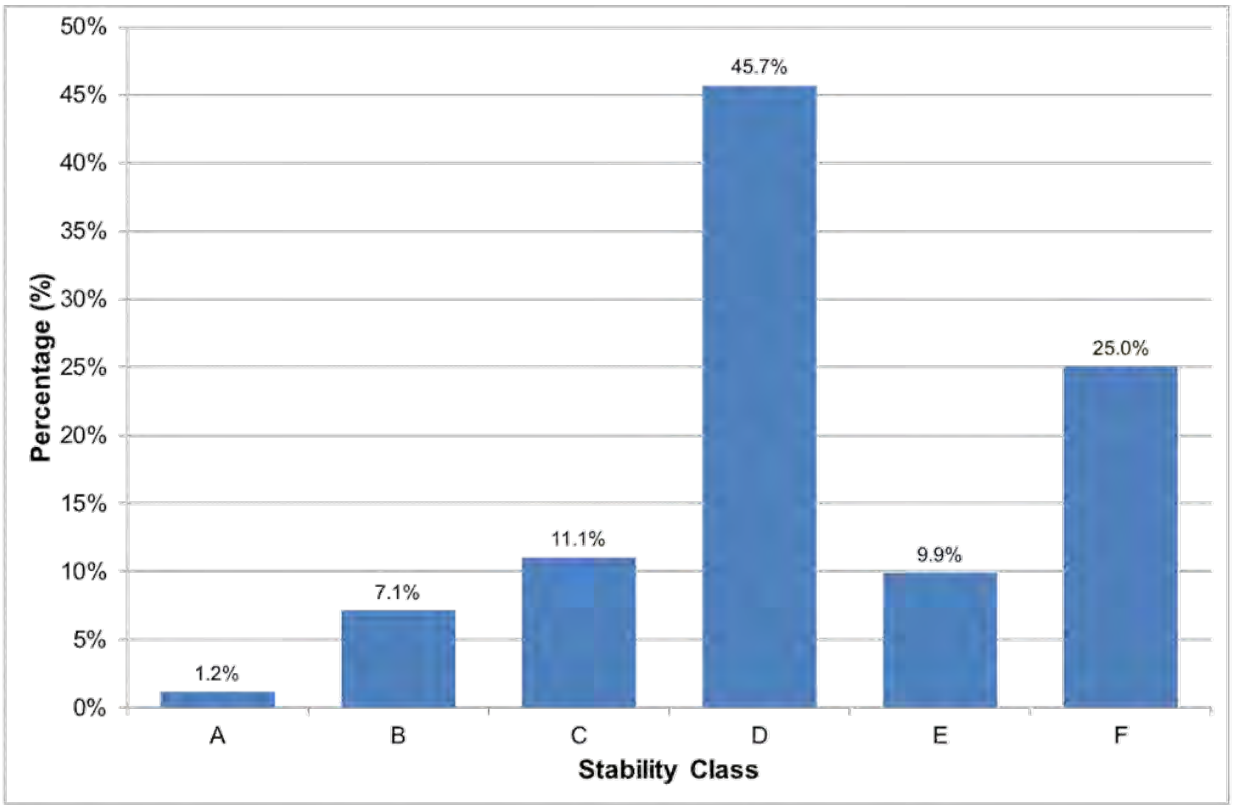


Figure A5.4 Stability Class distribution for Site as generated by CALMET

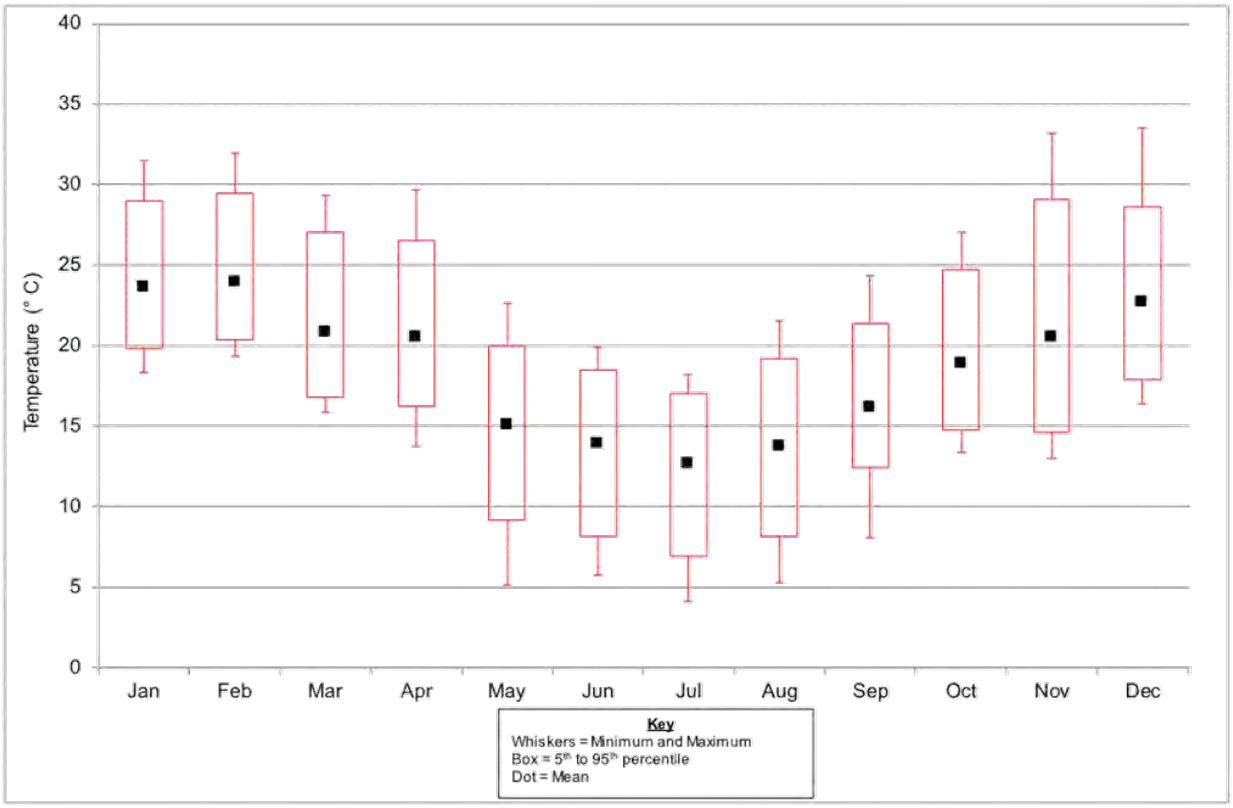


Figure A5.5 Box and Whisker plot of monthly temperature for Site as generated by CALMET

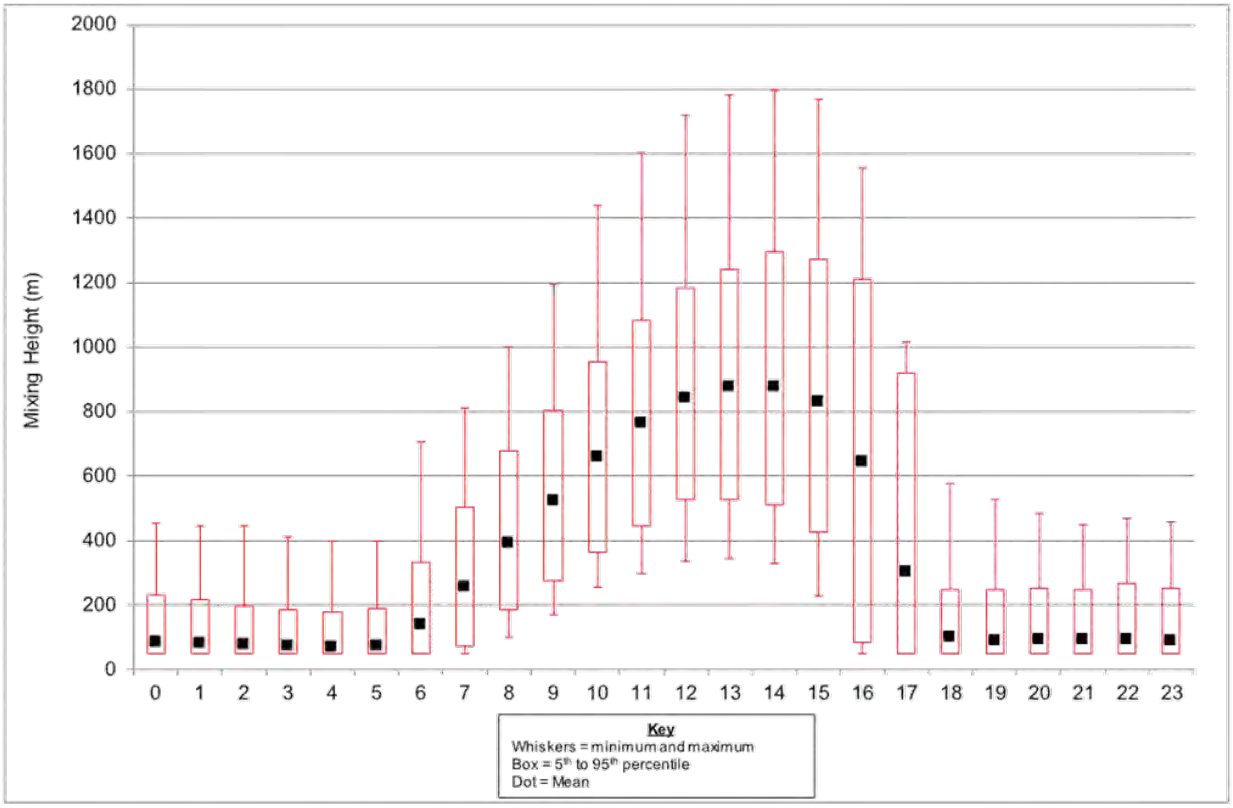


Figure A5.6 Box and Whisker plot of diurnal mixing height for Site as generated by CALMET

ATTACHMENT 5

Emission Estimation Calculations

WIND EROSION

EXPOSED STOCKPILE AND PROCESSING AREAS, EXTRACTION AREAS

NPI Emission Estimation Technique Manual for Mining (Environment Australia, 2012)

Silt Content (s): 7.5 % (*AP42 - Western Surface Coal mining - Mean for Overburden*)

No wind erosion emissions for wind speeds below 5.4m/s.

UNPAVED ROADS

ALL UNPAVED ROUTES FOR PRODUCT TRUCKS

USEPA AP42 Chapter 13.2.2 Unpaved Roads (2006)

Road Silt Content 8.3 %: (*USEPA AP42 Chapter 13.2.2 Table 13.2.2-1 Average for Quarry Haul Road*)

Control Measures: Level 1 watering (2 litres/m^2/hour) as required

PAVED ROADS

PAVED ENTRANCE TO SITE FOR PRODUCT TRUCKS

USEPA AP42 Chapter 13.2.1 Paved Roads (2011)

Road Silt Content 8.2 g/m^2: (*USEPA AP42 Chapter 13.2.2 Table 13.2.1 Average for Quarrying*)

Control Measures: Level 1 watering (2 litres/m^2/hour) as required

IN PIT ACTIVITIES

BULLDOZER REMOVING MATERIAL AND PUSHING TO PROCESSING AREA

NPI Emission Estimation Technique Manual for Mining (Environment Australia, 2012)

Reference: Bulldozer on Material other than Coal

Moisture Content: 1% Conservative estimate

Silt Content (s): 7.5 % (*AP42 - Western Surface Coal mining - Mean for Overburden*)

Control Measures: Reduction from 12 hours to 6 hours use under adverse meteorological conditions to minimise dust emissions

PROCESSING/STOCKPILE AREA

LOADING MOBILE PROCESSING PLANT WITH FRAGMENTED STONE

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: None

PROCESSING PLANT PRIMARY CRUSHING

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: None.

PROCESSING PLANT SECONDARY CRUSHING

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: None.

PROCESSING PLANT TERTIARY CRUSHING

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: Water Sprays to Processing Plant.

PROCESSING PLANT QUATERNARY CRUSHING

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: Water Sprays to Processing Plant.

PROCESSING PLANT SCREENING

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: Water Sprays to Processing Plant.

PROCESSING PLANT FINES SCREENING

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: Water Sprays to Processing Plant.

PROCESSING PLANT CONVEYOR TRANSFER POINTS

USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Control Measures: Water Sprays to Conveyor Transfer Points

LOADING STOCKPILES AT PROCESSING/STOCKPILE AREA

USEPA AP42 Chapter 13.2.4 Aggregate Handling and Storage Piles (2006)

Material moisture content % (M): 1 Conservative estimate

LOADING TRUCKS WITH CRUSHED PRODUCT (AT STOCKPILES)

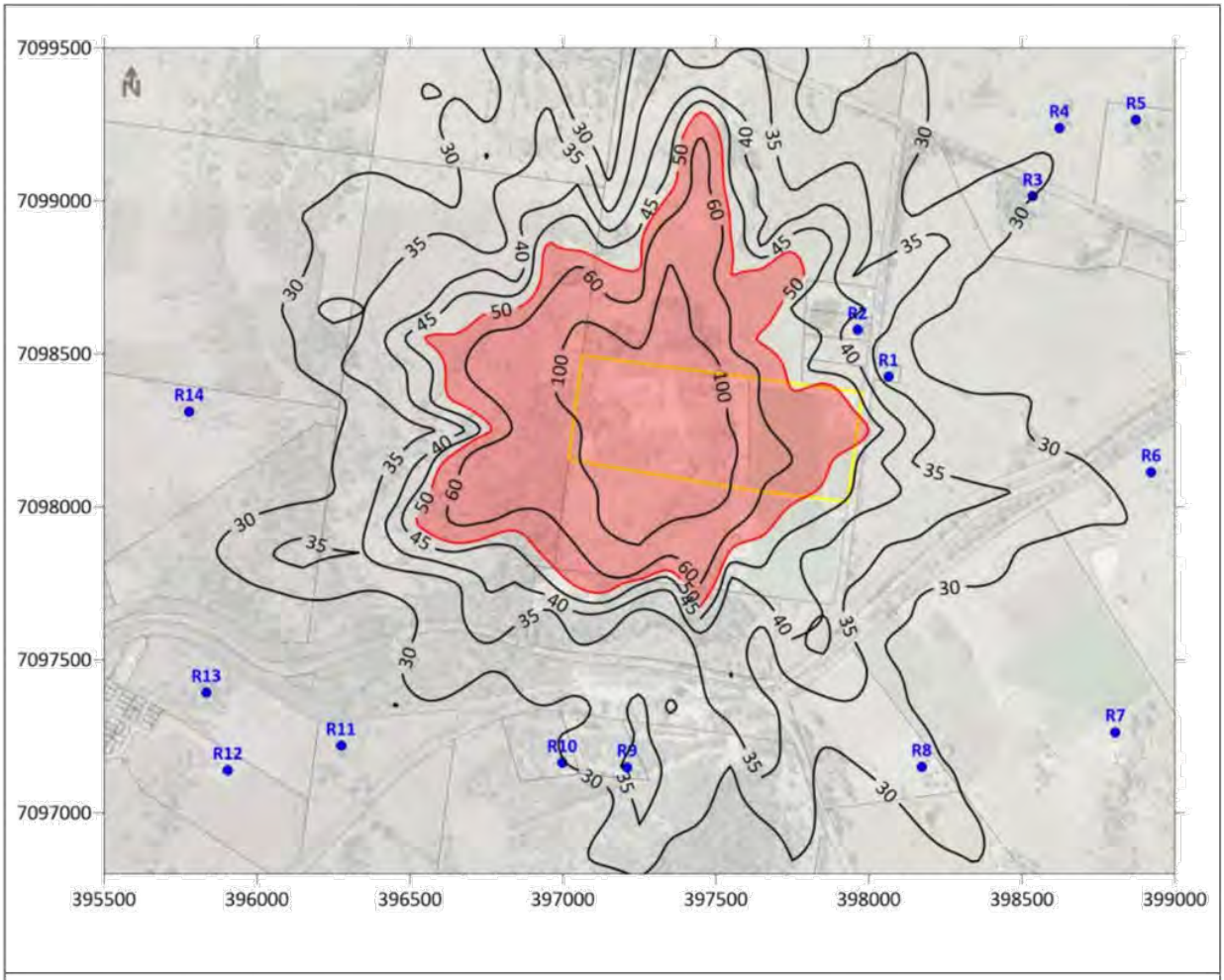
USEPA AP42 Chapter 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing (2004)

Murgon Quarry - Emission Rate Summary

Description of Activity	Pollutant		
	$PM_{2.5}$ (g/s)	PM_{10} (g/s)	TSP (g/s)
Extraction operations (Including dozer operations)	0.48	1.94	8.10
Material Handling in Stockpile Area	0.007	0.037	0.083
Paved Road Emissions - Product Trucks	0.001	0.002	0.013
Unpaved Road Emissions - Product Trucks	0.010	0.096	0.338
Wind Erosion (for wind speeds > 5.4m/s threshold)	0.27	1.81	3.63
Wind Erosion (annual average rate)	0.05	0.34	0.68
Sum (average rate)	**0.55**	**2.42**	**9.22**

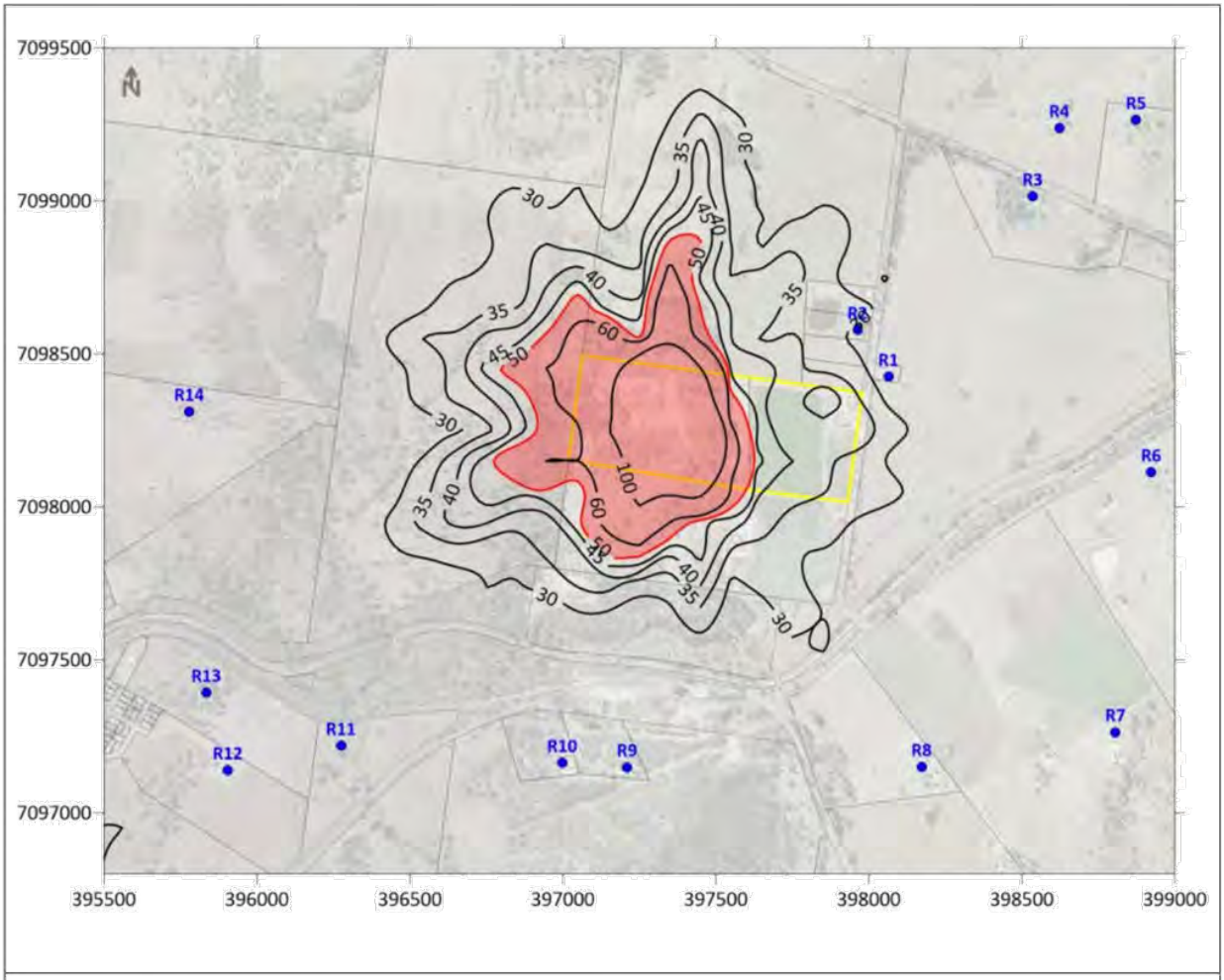
ATTACHMENT 6

Predicted Dust Concentrations / Deposition Rates Contour Plots



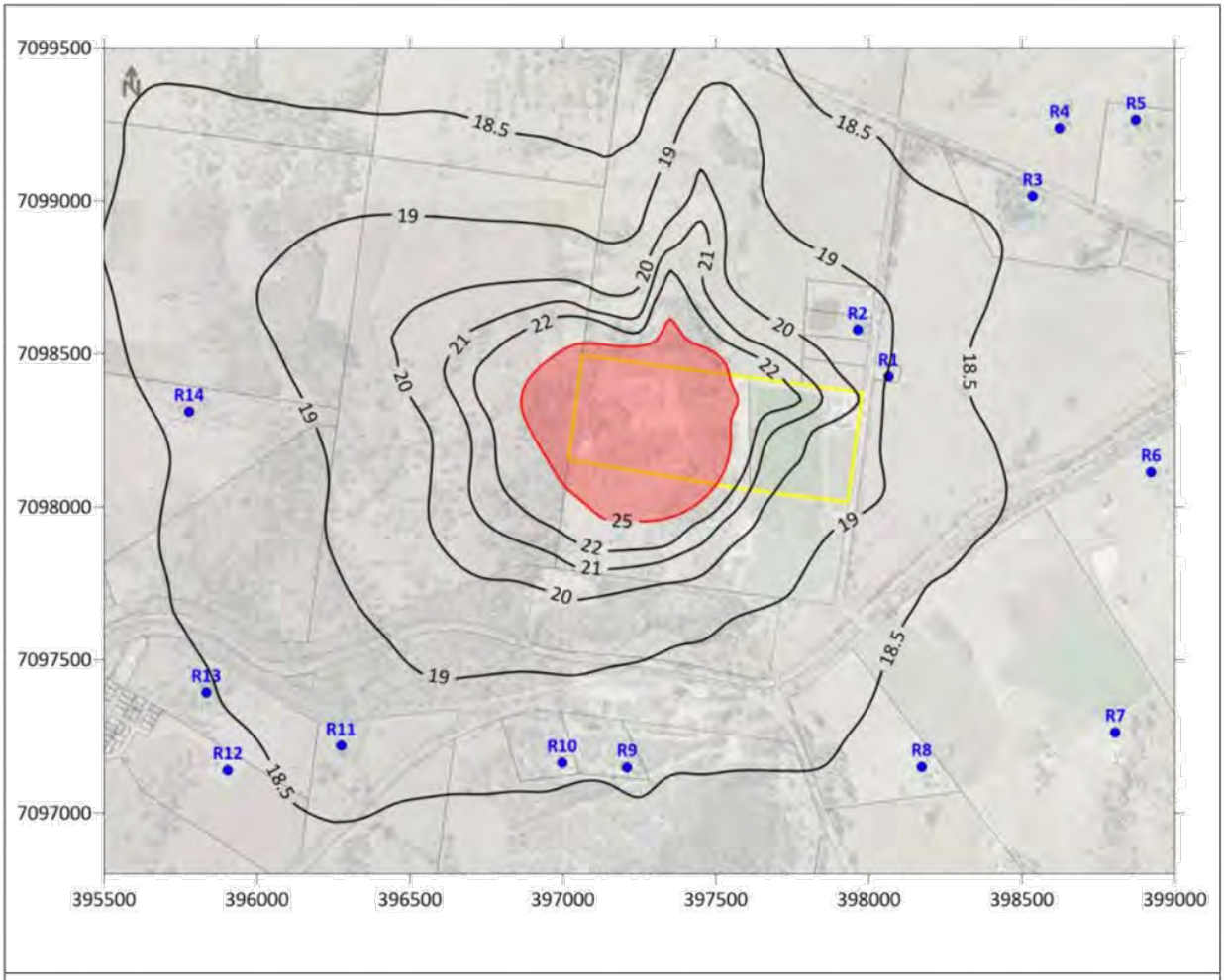
Proposed Murgon Quarry
Predicted PM_{10} maximum 24-hour average concentrations
Worst Case Continuous Dozer Operation

Figure A7.1	Pollutant	Averaging Period	Ambient Concentration	Objective	Date
mwa ENVIRONMENTAL	PM_{10}	24-hour Maximum	18.8 µg/m³	50 µg/m³	26-Sep-2023



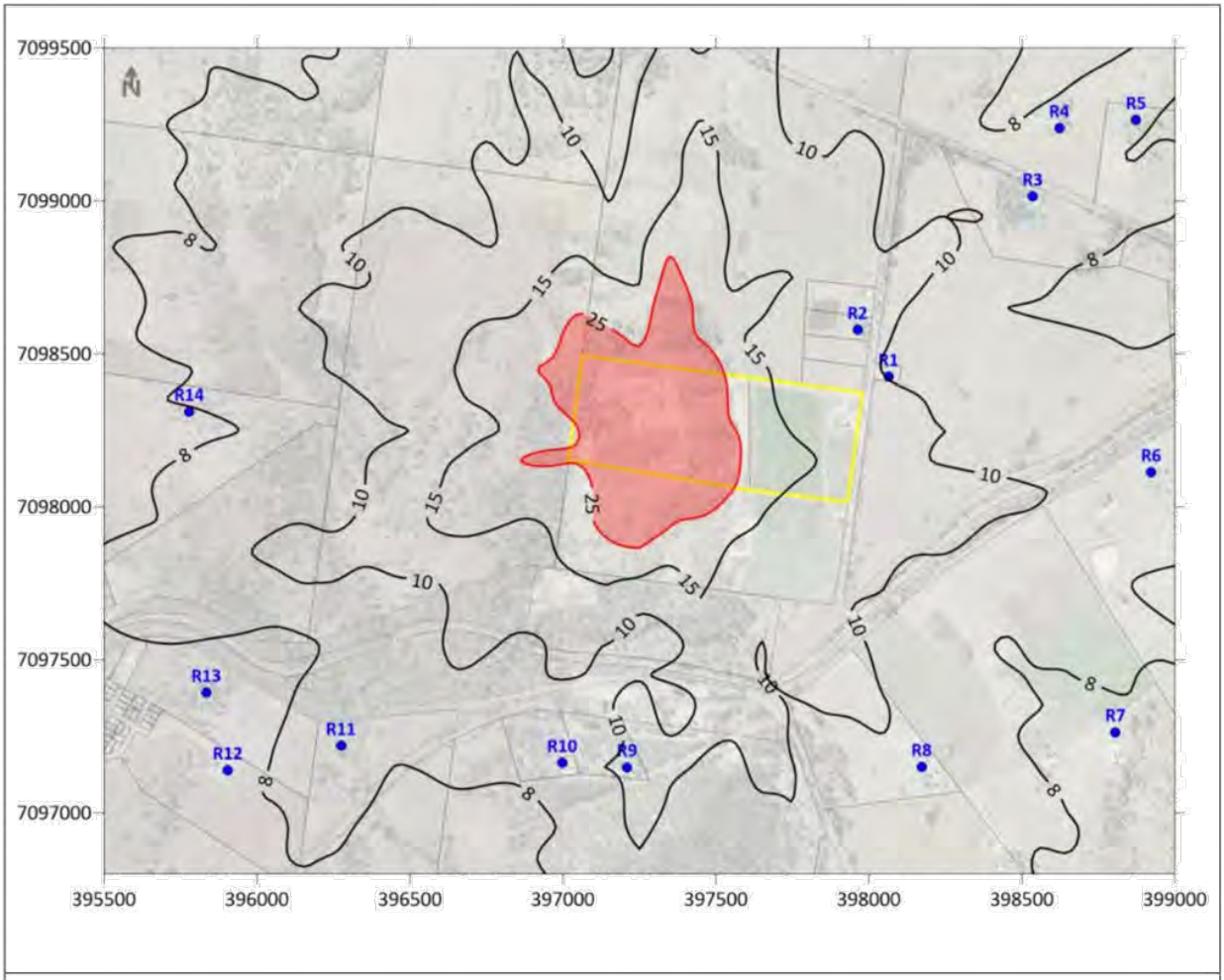
Proposed Murgon Quarry
Predicted PM_{10} maximum 24-hour average concentrations
More Realistic Dozer Operating Hours

Figure A7.2	Pollutant	Averaging Period	Ambient Concentration	Objective	Date
mwa ENVIRONMENTAL	PM_{10}	24-hour Maximum	18.8 µg/m³	50 µg/m³	26-Sep-2023



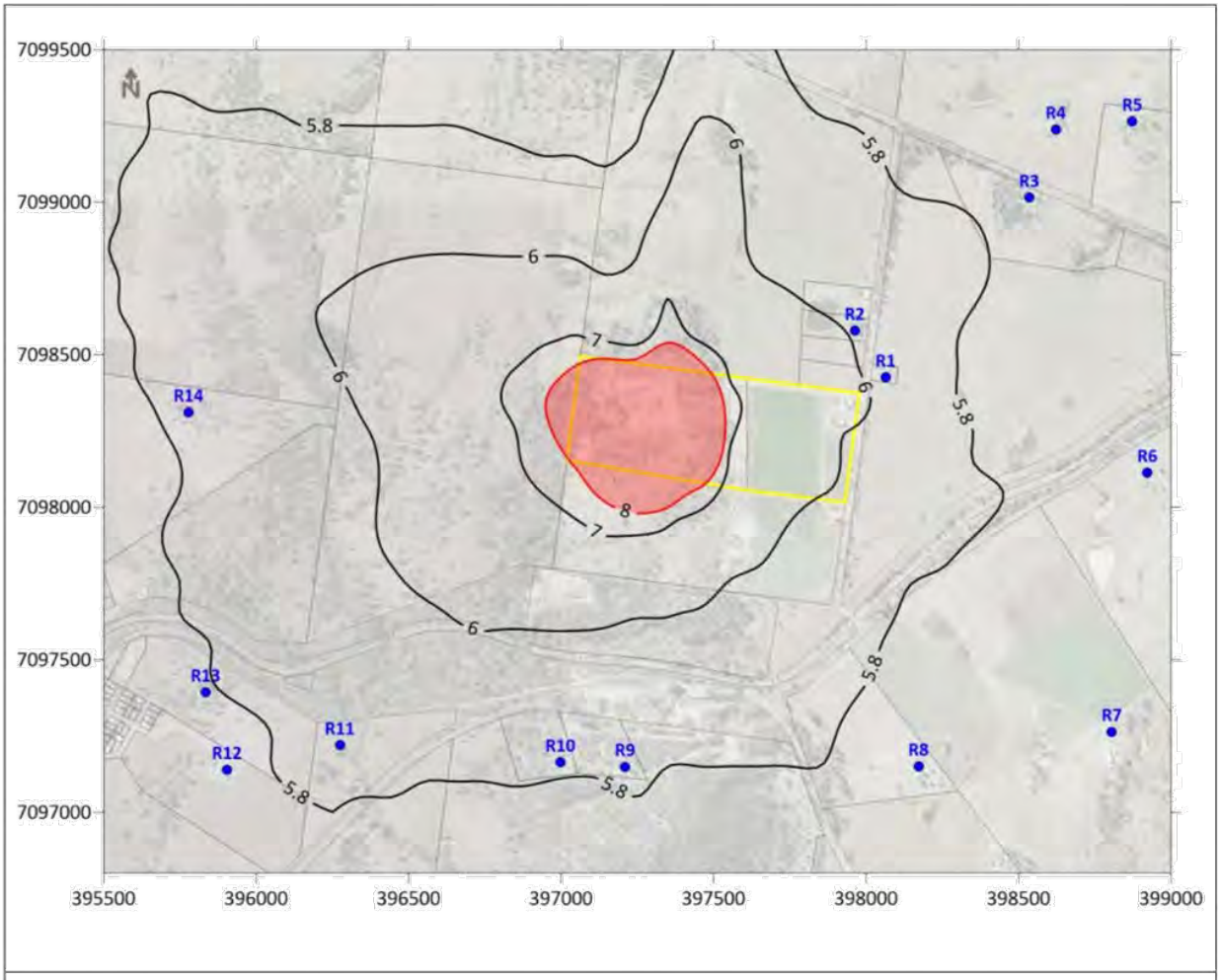
Proposed Murgon Quarry
Annual Average PM_{10} concentrations
Worst Case Continuous Dozer Operation

Figure A7.3	Pollutant	Averaging Period	Ambient Concentration	Objective	Date
mwa ENVIRONMENTAL	PM_{10}	Annual Average	18.1 µg/m³	25 µg/m³	26-Sep-2023



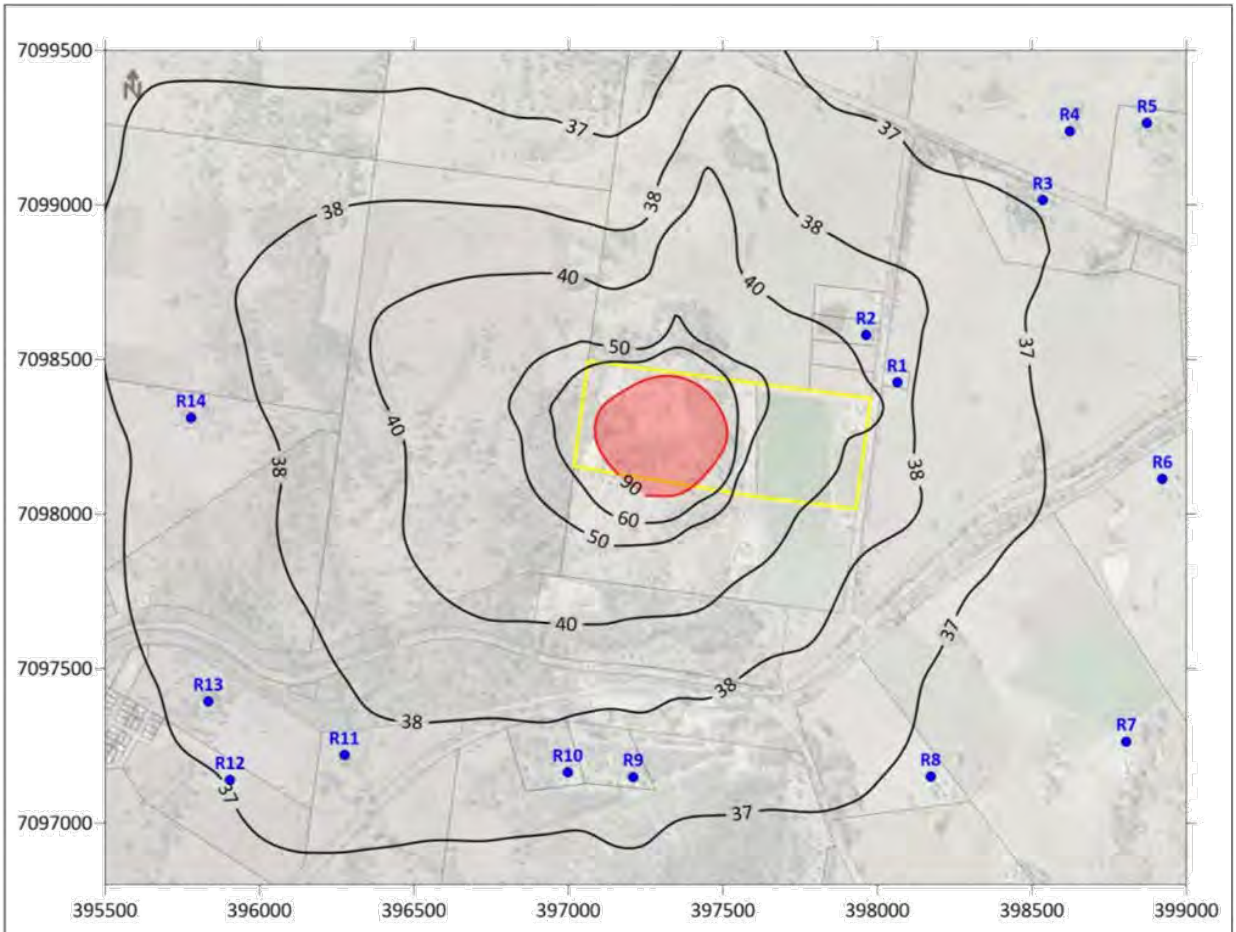
Proposed Murgon Quarry
Predicted $PM_{2.5}$ maximum 24-hour average concentrations
Worst Case Continuous Dozer Operation

Figure A7.4	Pollutant	Averaging Period	Ambient Concentration	Objective	Date
mwa ENVIRONMENTAL	$PM_{2.5}$	24-hour maximum	6.5 µg/m³	25 µg/m³	26-Sep-2023



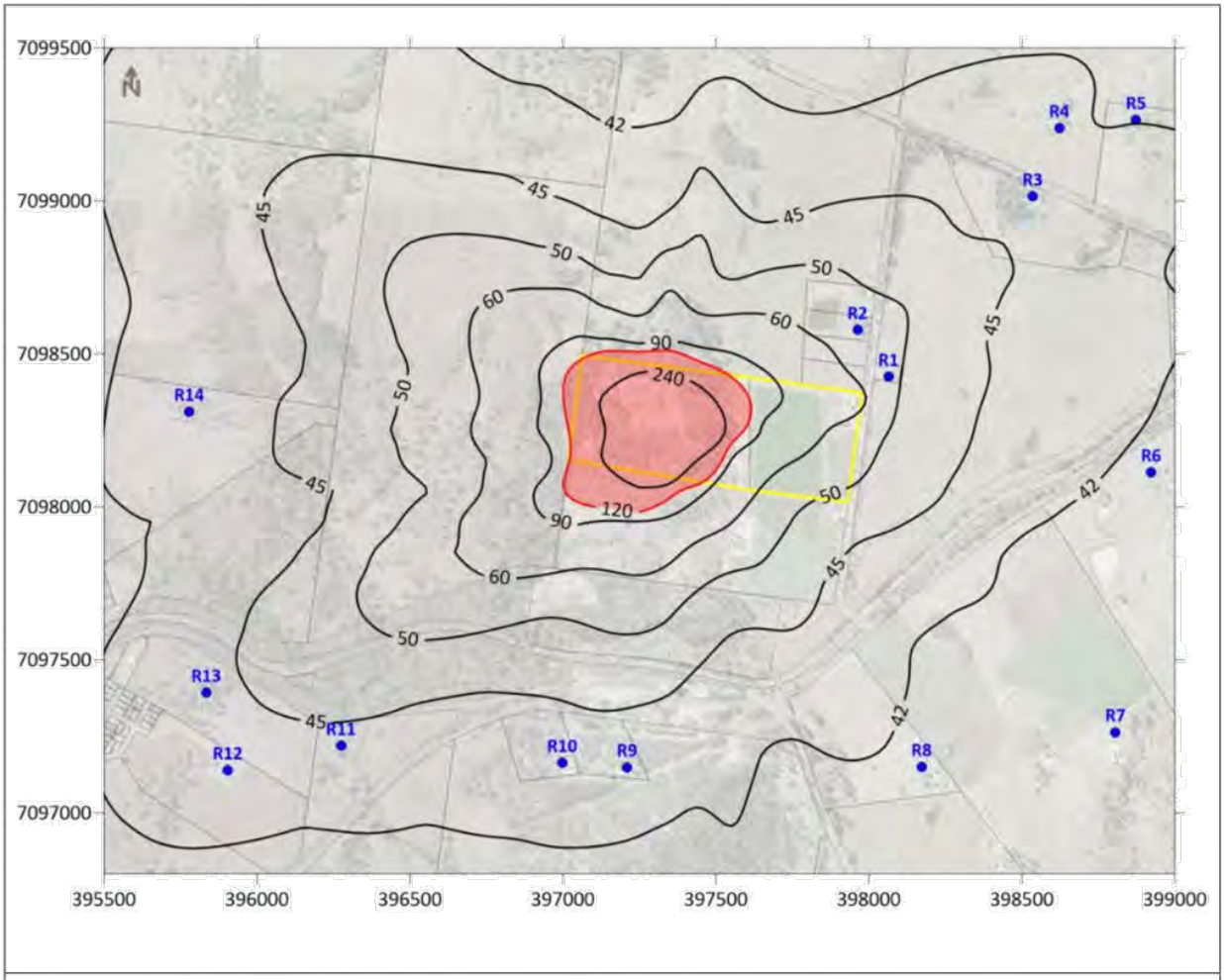
Proposed Murgon Quarry
Predicted Annual Average $PM_{2.5}$ concentrations
Worst Case Continuous Dozer Operation

Figure A7.5	Pollutant	Averaging Period	Ambient Concentration	Objective	Date
mwa ENVIRONMENTAL	$PM_{2.5}$	Annual Average	5.7 µg/m³	8 µg/m³	26-Sep-2023



Proposed Murgon Quarry
Predicted Annual Average TSP concentrations
Worst Case Continuous Dozer Operation

Figure A7.6	Pollutant	Averaging Period	Ambient Concentration	Objective	Date
mwa ENVIRONMENTAL	TSP	Annual Average	36.2 µg/m³	90 µg/m³	26-Sep-2023



Proposed Murgon Quarry
Predicted Monthly Average Dust Deposition rates
Worst Case Continuous Dozer Operation

Figure A7.7	Pollutant	Averaging Period	Background Rate	Typical ERA limit	Date
mwa ENVIRONMENTAL	Dust Deposition	Monthly	40 mg/m^2/day	120 mg/m^2/day	26-Sep-2023

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79 ZERNERS ROAD, MURGON

PTT TECHNICAL NOTE: ADDENDUM TO TRAFFIC IMPACT ASSESSMENT

INTRODUCTION

PTT has been engaged by Roamalla Pty Ltd to prepare an addendum to our Traffic Impact Assessment in support of a development application to extract quarry material from land located at 79 Zerners Road, Murgon (PTT reference 22-644 Traffic Impact Assessment Revision A, dated 11 November 2022). The purpose of this technical note is to review the traffic and pavement impacts associated with a proposed increase in the level of extraction from 48,188 tonnes of material per annum to 100,000 tonnes per annum.

No changes to the site layout or access arrangements are proposed and this technical note focuses on the external impacts of the increase in the level of extraction. The findings and recommendations of our assessment are presented below.

TRAFFIC GENERATION

The daily and peak hour traffic generation for the quarry has been estimated based on the expected annual production levels, the hours and days of operation and average truck capacity, as outlined in Table 1.

Table 1: ESTIMATED QUARRY TRUCK VOLUMES

OPERATING DETAILS	MAXIMUM PRODUCTION
Annual Production	100,000 tonnes/year
Days per year operation (Monday – Saturday)	300 days/year
Hours per day operation	12 hours/day
Average truck payload	27 tonnes/truck
Average daily truck numbers	26 two-way movements (13 arrivals and 13 departures)
Average peak hour truck numbers	2-4 two-way truck movements (1-2 arrivals and 1-2 departures)
Staff daily traffic movements (4 employees)	8 two-way movements (4 arrivals and 4 departures)

DISTRIBUTION OF DEVELOPMENT TRAFFIC

The predicted distribution of development traffic has been refined from that presented in the Traffic Impact Assessment following consultation with the operator and analysis of the historic quarry sales records. The vast majority of extracted material would be transported via the Bunya Highway towards Murgon with the detailed breakdown predicted to be as follows:

- 10% to / from Goomeri (via Bunya Highway)
- 10% to / from Moffatdale (via Bunya Highway, Kilcoy - Murgon Road and Murgon - Barambah Road)
- 10% to / from the bulk landscape supplies store located at Murgon (via Bunya Highway, Murgon - Gayndah Road and Gesslers Road)
- 30% to / from Wondai (via Bunya Highway)
- 20% to / from Windera (via Bunya Highway and Murgon - Gayndah Road)
- 20% to / from Byee / Proston (via Bunya Highway and Silverleaf Road)

The estimated distribution of quarry traffic is shown in Figure 1.

Figure 1: DISTRIBUTION OF QUARRY TRUCKS

TRAFFIC IMPACT

Bunya Highway / Zerners Road Intersection

The proposed increase in the level of extraction would have a minimal impact on peak hour traffic generation (ie an additional two peak hour movements). Accordingly, the findings and recommendations contained in Section 4.1 of the Traffic Impact Assessment remain valid. That is, a basic left (BAL) turn treatment be provided at the Bunya Highway / Zerners Road intersection. However, while technically warranted, there would be limited benefit in providing a basic right (BAR) turn treatment given that the vast majority of quarry traffic travels to / from the south (ie towards Murgon) and the number of vehicles turning right from the Buyna Highway into Zerners Road is negligible.

Zerners Road

The proposed net expansion to the level of extraction (ie 51,812 tonnes per annum) would be expected to result in an increase in the AADT on Zerners Road approximately of 12 vehicles per day (ie from an AADT of around 80 vehicles to 92 vehicles). Accordingly, the recommendation of the Traffic Impact Assessment that grading and reconstruction works be undertaken to the shoulder on both sides of the Zerners Road between the site access and the intersection with the Bunya Highway remains valid.

PAVEMENT IMPACT ASSESSMENT

Introduction

A revised assessment has been undertaken considering the pavement impact of the quarry on the state-controlled road network, to the north and south of the Zerners Road intersection as follows.

- North of Zerners Road
  - Bunya Highway (Road Section 45B): from Ch 49.4 to 60.1 (10.6km in length)
- South of Zerners Road
  - Bunya Highway (Road Section 45B): from Ch 30.1 to 49.4 (19.3km in length)
  - Kilcoy - Murgon Road (Road Section 491): from Ch 115.2 to 116.9 (1.7km in length)
  - Murgon - Barambah Road (Road Section 437): from Ch 0 to 14.1 (14.1km in length)
  - Murgon - Gayndah Road: from Ch 0 to 31.4 (31.4km in length)

This assessment has been based on the latest (2021) AADT information and road asset data for the relevant sections of road, which is attached.

Methodology and Assumptions

The methodology adopted for the assessment of pavement impacts is generally in accordance with that set out in the Guide to Traffic Impact Assessment (GTIA).

The performance of sealed road pavement is modelled based on the amount of heavy vehicle traffic, measured in Standard Axle Repetitions (SAR). SARs is a "measure defining the cumulative damaging effect to the pavement of the actual traffic, it is expressed in terms of the equivalent number of 80kN axles passing over the pavement up to the design horizon."

SARs are calculated with a damage exponent based on the specific type of damage. Damage exponents used in this analysis are shown in Table 2.

Table 2: SARS DAMAGE EXPONENTS

TYPE OF DAMAGE	LOAD DAMAGE EXPONENT	DAMAGE UNIT
Overall pavement damage	4	ESA/SAR4
Fatigue of asphalt	5	SAR5
Fatigue of cemented materials	12	SAR12

The adopted assessment process is as follows:

- determine the road links proposed to be affected by traffic generated by the proposed use
- determine the existing SARs for each section of the state-controlled road network in the impact assessment area (base case)
- calculate the number and type of heavy vehicles that will be generated by the quarry and calculate the SARs for the development scenario
- determine the road links where the development scenario SARs exceeds 5% of the base case SARs in either direction on the road link in the year of opening of each stage (the road links where the 5% threshold is exceeded is the impact assessment area for the pavement assessment)
- identify the relevant marginal cost rate per SAR-km from TMR marginal cost for each road link in the impact assessment area

Traffic Generation and Distribution

The site operating details and estimated traffic generation are shown in Table 3. The estimated distribution of quarry trucks is shown in Figure 1.

Table 3: TRAFFIC GENERATION

ITEM	OPERATIONAL DETAILS
Development Yield:	100,000 tonnes per annum
Days per year of Operation:	300 days/year
Opening Year:	2023
Vehicle Type:	Class 9 (Rigid Truck and Dog)
Payload:	27 tonnes/truck
Heavy Vehicle Volumes:	26 trips per day (13 inbound and 13 outbound)
Heavy Vehicle Loading:	Inbound = 100% unloaded, Outbound = 100% loaded

Background Traffic Growth

A 3.0% annual compound growth rate has been adopted in accordance with the GTIA Practice Note: Pavement Impact Assessment.

Background SARS

Background SAR4s on the surrounding state-controlled road network are calculated in Table 4. The 1.7km section of Kilcoy – Murgon Road between Murgon – Barambah Road and the Bunya Highway (chainage 115.2 to 116.9) has been estimated by adding the AADT for both Kilcoy – Murgon Road and Murgon – Barambah Road. It is acknowledged that the background SAR4s includes some existing development traffic (ie up to 48,188 tonnes of material per annum associated with current operations). However, this has a minimal impact on the results.

Table 4: BACKGROUND SAR4S

ROADNAME	DIRECTION	TDISTSTART	TDISTEND	AADT	PERCENT_HV	SAR4_PER_HV	SAR4_PER_DAY 2021	SAR4_PER_DAY 2023	SAR4_PER_YEAR 2023
Bunya Highway	A	0.0	5.9	2736	23%	3.2	2030	2154	786202
Bunya Highway	G	0.0	5.9	2678	7%	3.2	620	657	239920
Bunya Highway	A	5.9	21.4	2336	14%	3.2	1026	1088	397141
Bunya Highway	G	5.9	21.4	2293	13%	3.2	961	1020	372214
Bunya Highway	A	21.4	30.1	1751	17%	3.2	964	1022	373192
Bunya Highway	G	21.4	30.1	1720	11%	3.2	621	659	240624
Bunya Highway	A	30.1	43.3	1816	10%	3.2	557	591	215800
Bunya Highway	G	30.1	43.3	1756	24%	3.2	1363	1446	527877
Bunya Highway	A	43.3	45.4	1816	10%	3.2	557	591	215800
Bunya Highway	G	43.3	45.4	1756	24%	3.2	1363	1446	527877
Bunya Highway	A	45.4	45.8	1816	10%	3.2	557	591	215800
Bunya Highway	G	45.4	45.8	1756	24%	3.2	1363	1446	527877
Bunya Highway	A	45.8	52.7	988	11%	3.2	344	365	133322
Bunya Highway	G	45.8	52.7	943	12%	3.2	375	398	145245
Bunya Highway	A	52.7	60.1	994	40%	3.2	1286	1364	497975
Bunya Highway	G	52.7	60.1	975	10%	3.2	323	342	124923
Kilcoy - Murgon Road	A	115.2	116.9	429	11%	3.2	150	160	58239
Kilcoy - Murgon Road	G	115.2	116.9	417	19%	3.2	256	272	99130
Murgon - Barambah Road	A	0.0	14.1	374	18%	3.2	218	231	84252
Murgon - Barambah Road	G	0.0	14.1	383	11%	3.2	130	137	50164
Murgon - Gayndah Road	A	0.0	12.9	331	23%	3.2	243	258	94174
Murgon - Gayndah Road	G	0.0	12.9	322	34%	3.2	346	367	133826
Murgon - Gayndah Road	A	12.9	31.4	315	18%	3.2	179	179	65408
Murgon - Gayndah Road	G	12.9	31.4	336	44%	3.2	470	470	171696

Development Generated SAR4S

Development generated SAR4s are calculated in Table 5.

Table 5: DEVELOPMENT GENERATED SAR4S

VEHICLE CLASS	LOADED				UNLOADED				TOTAL_YEAR
	DAILY DEMAND	SAR4_PER_VEHICLE	SAR4_DAY	SAR4_YEAR	DAILY DEMAND	SAR4_PER_VEHICLE	SAR4_DAY	SAR4_YEAR	
Class 9	13	4.93	64.1	19227	13	0.51	6.63	1989	21216

All inbound vehicles will be unloaded and all outbound vehicles will be loaded. The development traffic distribution is calculated in Table 6.

Road Link Impacts

The development impacts on the state-controlled road network at the year of opening are determined in Table 7. Table 7 shows that three road links have been identified on the Bunya Highway where development volumes will have significant impacts (ie greater than 5%). These links are all in the loaded (southbound) direction between Murgon Gayndah Road and Zerners Road (ie between Ch 43.3 and Ch 49.3, a total road section of 6.0km).

Contributions to Offset Development Impacts

Relevant details for each impact road segment and contribution calculations are provided in Table 8. In summary, at an extraction level of 100,000 tonnes of material, the quarry is required to contribute **$3,990.36** per year of operation to offset development impacts. This equates to **4 cents** per tonne of extracted material.

Table 6: DEVELOPMENT TRAFFIC DISTRIBUTION

ROADNAME	ROAD DATA				DEVELOPMENT VOLUMES		
	DIRECTION	TDISTSTART	TDISTEND	SAR4_2023_YEAR	%DISTRIBUTION	LOAD STATUS	SAR4 / YEAR_2023
Bunya Highway	A	0.0	5.9	786202	30%	Loaded	5768
Bunya Highway	G	0.0	5.9	239920	30%	Unloaded	597
Bunya Highway	A	5.9	21.4	397141	30%	Loaded	5768
Bunya Highway	G	5.9	21.4	372214	30%	Unloaded	597
Bunya Highway	A	21.4	30.1	373192	30%	Loaded	5768
Bunya Highway	G	21.4	30.1	240624	30%	Unloaded	597
Bunya Highway	A	30.1	43.3	215800	50%	Loaded	9614
Bunya Highway	G	30.1	43.3	527877	50%	Unloaded	995
Bunya Highway	A	43.3	45.4	215800	80%	Loaded	15382
Bunya Highway	G	43.3	45.4	527877	80%	Unloaded	1591
Bunya Highway	A	45.4	45.8	215800	80%	Loaded	15382
Bunya Highway	G	45.4	45.8	527877	80%	Unloaded	1591
Bunya Highway	A	45.8	49.4	133322	80%	Loaded	15382
Bunya Highway	G	45.8	49.4	145245	80%	Unloaded	1591
Bunya Highway	A	49.4	52.7	133322	10%	Unloaded	199
Bunya Highway	G	49.4	52.7	145245	10%	Loaded	1923
Bunya Highway	A	52.7	60.1	497975	10%	Unloaded	199
Bunya Highway	G	52.7	60.1	124923	10%	Loaded	1923
Kilcoy - Murgon Road	A	115.2	116.9	58239	10%	Loaded	1923
Kilcoy - Murgon Road	G	115.2	116.9	99130	10%	Unloaded	199
Murgon - Barambah Road	A	0.0	14.1	84252	10%	Unloaded	199
Murgon - Barambah Road	G	0.0	14.1	50164	10%	Loaded	1923
Murgon - Gayndah Road	A	0.0	12.9	94174	30%	Unloaded	597
Murgon - Gayndah Road	G	0.0	12.9	133826	30%	Loaded	5768
Murgon - Gayndah Road	A	12.9	31.4	65408	20%	Unloaded	398
Murgon - Gayndah Road	G	12.9	31.4	171696	20%	Loaded	3845

Table 7: ROAD LINK IMPACTS

ROADNAME	DIRECTION	TDISTSTART	TDISTEND	BACKGROUND SAR4 YEAR_2023	DEVELOPMENT SAR4 YEAR_2023	DEVELOPMENT IMPACTS	> 5% IMPACT
Bunya Highway	A	0.0	5.9	786202	5768	0.7%	No
Bunya Highway	G	0.0	5.9	239920	597	0.2%	No
Bunya Highway	A	5.9	21.4	397141	5768	1.5%	No
Bunya Highway	G	5.9	21.4	372214	597	0.2%	No
Bunya Highway	A	21.4	30.1	373192	5768	1.5%	No
Bunya Highway	G	21.4	30.1	240624	597	0.2%	No
Bunya Highway	A	30.1	43.3	215800	9614	4.5%	No
Bunya Highway	G	30.1	43.3	527877	995	0.2%	No
Bunya Highway	A	43.3	45.4	215800	15382	7.1%	Yes
Bunya Highway	G	43.3	45.4	527877	1591	0.3%	No
Bunya Highway	A	45.4	45.8	215800	15382	7.1%	Yes
Bunya Highway	G	45.4	45.8	527877	1591	0.3%	No
Bunya Highway	A	45.8	49.4	133322	15382	11.5%	Yes
Bunya Highway	G	45.8	49.4	145245	1591	1.1%	No
Bunya Highway	A	49.4	52.7	133322	199	0.1%	No
Bunya Highway	G	49.4	52.7	145245	1923	1.3%	No
Bunya Highway	A	52.7	60.1	497975	199	0.0%	No
Bunya Highway	G	52.7	60.1	124923	1923	1.5%	No
Kilcoy - Murgon Road	A	115.2	116.9	58239	1923	3.3%	No
Kilcoy - Murgon Road	G	115.2	116.9	99130	199	0.2%	No
Murgon - Barambah Road	A	0.0	14.1	84252	199	0.2%	No
Murgon - Barambah Road	G	0.0	14.1	50164	1923	3.8%	No
Murgon - Gayndah Road	A	0.0	12.9	94174	597	0.6%	No
Murgon - Gayndah Road	G	0.0	12.9	133826	5768	4.3%	No
Murgon - Gayndah Road	A	12.9	31.4	65408	398	0.6%	No
Murgon - Gayndah Road	G	12.9	31.4	171696	3845	2.2%	No

Table 8: CONTRIBUTION CALCULATIONS

ROAD NAME	SECTION ID	DIRECTION	LENGTH	PAVEMENT TYPE	LOAD DAMAGE EXPONENT	MARGINAL COST	CLASS 9 DATA			DEVELOPER CONTRIBUTIONS ($)
							VOLUME $ PER YEAR	SAR PER TRIP	SAR PER YEAR	
Bunya Highway	45B	Southbound	0.10	AC	5	5.53	2963	4.93	14608	80.78
Bunya Highway	45B	Southbound	0.10	AC	5	6.6	2963	4.93	14608	96.41
Bunya Highway	45B	Southbound	0.10	AC	5	7.31	2963	4.93	14608	106.78
Bunya Highway	45B	Southbound	0.10	AC	5	12.37	2963	4.93	14608	180.70
Bunya Highway	45B	Southbound	0.10	AC	5	8.04	2963	4.93	14608	117.45
Bunya Highway	45B	Southbound	0.10	AC	5	6.72	2963	4.93	14608	98.16
Bunya Highway	45B	Southbound	0.06	AC	5	6.03	2963	4.93	14608	52.85
Bunya Highway	45B	Southbound	0.04	AC	5	6.03	2963	4.93	14608	35.23
Bunya Highway	45B	Southbound	0.10	AC	5	4.04	2963	4.93	14608	59.01
Bunya Highway	45B	Southbound	0.10	AC	5	2.95	2963	4.93	14608	43.09
Bunya Highway	45B	Southbound	0.10	AC	5	2.64	2963	4.93	14608	38.56
Bunya Highway	45B	Southbound	0.10	AC	5	3.81	2963	4.93	14608	55.65
Bunya Highway	45B	Southbound	0.10	AC	5	4.99	2963	4.93	14608	72.89
Bunya Highway	45B	Southbound	0.10	AC	5	5.35	2963	4.93	14608	78.15
Bunya Highway	45B	Southbound	0.10	AC	5	9.2	2963	4.93	14608	134.39
Bunya Highway	45B	Southbound	0.10	AC	5	9.92	2963	4.93	14608	144.91
Bunya Highway	45B	Southbound	0.08	AC	5	10.5	2963	4.93	14608	122.70
Bunya Highway	45B	Southbound	0.02	AC	5	10.5	2963	4.93	14608	30.68
Bunya Highway	45B	Southbound	0.10	AC	5	4.37	2963	4.93	14608	63.84
Bunya Highway	45B	Southbound	0.10	AC	5	4.16	2963	4.93	14608	60.77
Bunya Highway	45B	Southbound	0.10	AC	5	4.84	2963	4.93	14608	70.70
Bunya Highway	45B	Southbound	0.10	AC	5	3.5	2963	4.93	14608	51.13
Bunya Highway	45B	Southbound	0.04	AC	5	4.71	2963	4.93	14608	27.52
Bunya Highway	45B	Southbound	0.06	AC	5	4.71	2963	4.93	14608	41.28
Bunya Highway	45B	Southbound	0.10	AC	5	3.93	2963	4.93	14608	57.41
Bunya Highway	45B	Southbound	0.10	AC	5	4.74	2963	4.93	14608	69.24
Bunya Highway	45B	Southbound	0.10	AC	5	4.08	2963	4.93	14608	59.60
Bunya Highway	45B	Southbound	0.10	AC	5	5.2	2963	4.93	14608	75.96
Bunya Highway	45B	Southbound	0.10	AC	5	4.92	2963	4.93	14608	71.87
Bunya Highway	45B	Southbound	0.10	GN	4	3.71	2963	4.93	14608	54.19
Bunya Highway	45B	Southbound	0.10	GN	4	3.25	2963	4.93	14608	47.47
Bunya Highway	45B	Southbound	0.10	GN	4	2.78	2963	4.93	14608	40.61
Bunya Highway	45B	Southbound	0.10	GN	4	3.31	2963	4.93	14608	48.35
Bunya Highway	45B	Southbound	0.10	GN	4	3.56	2963	4.93	14608	52.00
Bunya Highway	45B	Southbound	0.10	GN	4	3.84	2963	4.93	14608	56.09
Bunya Highway	45B	Southbound	0.10	GN	4	3.49	2963	4.93	14608	50.98
Bunya Highway	45B	Southbound	0.10	GN	4	3.06	2963	4.93	14608	44.70

ROAD NAME	SECTION ID	DIRECTION	LENGTH	PAVEMENT TYPE	LOAD DAMAGE EXPONENT	MARGINAL COST	CLASS 9 DATA			DEVELOPER CONTRIBUTIONS ($)
							VOLUMES PER YEAR	SAR PER TRIP	SAR PER YEAR	
Bunya Highway	45B	Southbound	0.10	GN	4	3.83	2963	4.93	14608	55.95
Bunya Highway	45B	Southbound	0.10	GN	4	3.8	2963	4.93	14608	55.51
Bunya Highway	45B	Southbound	0.10	GN	4	2.61	2963	4.93	14608	38.13
Bunya Highway	45B	Southbound	0.10	GN	4	2.47	2963	4.93	14608	36.08
Bunya Highway	45B	Southbound	0.10	GN	4	2.73	2963	4.93	14608	39.88
Bunya Highway	45B	Southbound	0.10	GN	4	2.61	2963	4.93	14608	38.13
Bunya Highway	45B	Southbound	0.10	GN	4	3.37	2963	4.93	14608	49.23
Bunya Highway	45B	Southbound	0.10	GN	4	3.19	2963	4.93	14608	46.60
Bunya Highway	45B	Southbound	0.10	GN	4	3.01	2963	4.93	14608	43.97
Bunya Highway	45B	Southbound	0.10	GN	4	3.64	2963	4.93	14608	53.17
Bunya Highway	45B	Southbound	0.10	GN	4	3.44	2963	4.93	14608	50.25
Bunya Highway	45B	Southbound	0.10	GN	4	8.06	2963	4.93	14608	117.74
Bunya Highway	45B	Southbound	0.10	GN	4	7.89	2963	4.93	14608	115.25
Bunya Highway	45B	Southbound	0.10	GN	4	6.45	2963	4.93	14608	94.22
Bunya Highway	45B	Southbound	0.10	GN	4	3.08	2963	4.93	14608	44.99
Bunya Highway	45B	Southbound	0.10	GN	4	3.3	2963	4.93	14608	48.21
Bunya Highway	45B	Southbound	0.10	GN	4	2.57	2963	4.93	14608	37.54
Bunya Highway	45B	Southbound	0.10	GN	4	2.37	2963	4.93	14608	34.62
Bunya Highway	45B	Southbound	0.10	GN	4	2.75	2963	4.93	14608	40.17
Bunya Highway	45B	Southbound	0.10	GN	4	2.56	2963	4.93	14608	37.40
Bunya Highway	45B	Southbound	0.10	GN	4	2.27	2963	4.93	14608	33.16
Bunya Highway	45B	Southbound	0.10	GN	4	3.92	2963	4.93	14608	57.26
Bunya Highway	45B	Southbound	0.10	GN	4	4.92	2963	4.93	14608	71.87
Bunya Highway	45B	Southbound	0.10	GN	4	4.57	2963	4.93	14608	66.76
Bunya Highway	45B	Southbound	0.10	GN	4	2.96	2963	4.93	14608	43.24
Bunya Highway	45B	Southbound	0.10	GN	4	3.35	2963	4.93	14608	48.94
TOTAL			**6.00**							**$ 3,990.36**

18 QUESTIONS ON NOTICE

18.1 QUESTION ON NOTICE - COMPARISON OF INFRASTRUCTURE CHARGES

File Number: **13-12-2023**

Author: **Executive Assistant Liveability**

Authoriser: **Chief Executive Officer**

The following question on notice was received from Councillor Duff.

Question

Can a full report be brought back with a comparison of infrastructure fees and charges between other Council's?

Response

Attached is a table which provides a comparison of South Burnett's Infrastructure Charges compared to the Western Downs, Gympie and Bundaberg Regional Council's.

RECOMMENDATION

That the response to the question regarding a full report be brought back with a comparison of infrastructure fees and charges between other Council's raised by Councillor Duff be received and noted.

ATTACHMENTS

1. Infrastructure Charges Comparision

Local Government Infrastructure Charges Comparison

	SBRC	WDRC	Gympie	Bundaberg
Charges Reduction Policy	Yes	Yes – conditional on location	No	Yes – for significant projects only
Residential (Reconfiguring a lot – $ per lot)	20,085	25,200	30,617	25,997
Material Change of Use				
Residential Uses – Per Dwelling				
1 Bedroom Dwelling ($ per dwelling)	14,346	15,000	21,912	18,569
2 Bedroom Dwelling ($ per dwelling)	14,346	18,000	21,912	18,569
3 Bedroom Dwelling ($ per dwelling)	20,494	25,200	30,677	25,997
Accommodation (Short Term)				
1 Bedroom Suite ($ per suite)	7,173	7,500	10,956	9,284
2 Bedroom Suite ($ per suite)	7,173	9,000	6,500	9,284
3 Bedroom Suite ($ per suite)	10,042	12,600	6,500	12,998

	SBRC	WDRC	Gympie	Bundaberg
Accommodation (Long Term)				
1 Bedroom Suite ($ per suite)	14,346	13,000	10,000	18,567
2 Bedroom Suite ($ per suite)	14,346	15,000	10,000	18,567
3 Bedroom Suite ($ per suite)	20,085	19,000	10,000	25,997

Commercial Uses

Places of assembly ($/m2)	50	59.5	52	65 (+ $9.28p/m^2)
Commercial (bulk goods) ($/m2)	100	119	97	130 (+ $9.28p/m^2)
Commercial (retail) ($/m2)	129	153	122	167(+ $9.28p/m^2)
Commercial (office) ($/m2)	100	119	96	130(+ $9.28p/m^2)
Education facility ($/m2)	100	110	93	130(+ $9.28p/m^2)
Entertainment ($/m2)	143	170	97	186(+ $9.28p/m^2)
Indoor sport and recreation				
excl. court area ($/m2)	143	174	138	186(+ $9.28p/m^2)
court area ($/m2)	4	21	13	186(+ $9.28p/m^2)

	SBRC	WDRC	Gympie	Bundaberg
High impact industry or special industry ($/m2)	50	63.5	52	65(+ $9.28p/m^2)
Other industry ($/m2)	36	42.5	38	46(+ $9.28p/m^2)
High impact rural ($/m2)	14	21	13	18(+ $9.28p/m^2)
Low impact rural	0	0	0	0
Essential services ($/m2)	100	119	97	130(+ $9.28p/m^2)

18.2 QUESTION ON NOTICE - BLACKBUTT TRANSFER STATION

File Number: **13-12-2023**

Author: **Executive Assistant Liveability**

Authoriser: **Chief Executive Officer**

The following question on notice was received from Councillor Acting Mayor Jones.

Question

Can clear indication be given of what is permitted at the Blackbutt Transfer Station?

Response

The State Government's Waste Recycling and Recycling legislation provides the definition of what is considered a commercial premise and what is defined as commercial waste**.**

Commercial premises means any of the following types of premises—

(a) a hotel, motel, caravan park, cafe, food store or canteen;

(b) an assembly building, institutional building, kindergarten, child minding centre, school or other building used for education;

(c) premises where a sport or game is ordinarily played in public;

(d) an exhibition ground, show ground or racecourse;

(e) an office, shop or other premises where business or work, other than a manufacturing process, is carried out.

Commercial waste means waste, other than green waste, recyclable waste, interceptor waste or waste discharged to a sewer, produced as a result of the ordinary use or occupation of commercial premises.

The only other proviso is that the commercial waste coming to the Blackbutt facility is able to fit into the bins provided.

RECOMMENDATION

That the response to the question regarding what is permitted at the Blackbutt Transfer Station raised by Acting Mayor Jones be received and noted.

ATTACHMENTS

Nil

18.3 QUESTION ON NOTICE - APPROVED SUBDIVISIONS IN THE REGION

File Number: **13-12-2023**

Author: **Executive Assistant Liveability**

Authoriser: **Chief Executive Officer**

The following question on notice was received from Councillor Erkens.

Question

Can a report on the approved subdivisions within the region be brought back to Council?

Response

Attached is a table which contains a list of subdivisions by town / region that have been approved by Council between 1 January 2020 to 5 December 2023.

RECOMMENDATION

That the response to the question regarding approved subdivisions within the region be brought back to Council raised by Councillor Erkens be received and noted.

ATTACHMENTS

1. Subdivision Statistics - January 2020 to December 2023

TOTAL LOTS APPROVED BY SBRC – 01/01/2020 TO 05/12/2023*

Former Shire	Application No.	Date Approved	Property Address	No. lots Approved
Wondai	RAL20/0014	4/11/2020	816 Coverty Road, BALLOGIE	1 into 2
Nanango	RAL20/0018	26/05/2021	89 Bunya Way, BLACKBUTT	1 into 2
Nanango	RAL22/0014	13/07/2022	107 Coulson Street, BLACKBUTT	1 into 2
Nanango	RAL22/0002	31/03/2022	5 Greenhills Drive, BLACKBUTT	1 into 2
Nanango	RAL22/0038	15/11/2022	122 Greenhills Drive, BLACKBUTT	1 into 2
Nanango	RAL22/0019	24/10/2022	73 Griffins Road, BLACKBUTT	1 into 2
Nanango	RAL23/0012	18/09/2023	Reservoir Service Road, BLACKBUTT	1 into 3
Kingaroy	RAL20/0001	20/03/2020	22 Malar Road, BOOIE	1 into 3
Kingaroy	RAL20/0013	15/10/2020	22 Malar Road, BOOIE	1 into 3
Kingaroy	RAL22/0023	16/02/2023	58 Malar Road, BOOIE	1 into 2
Nanango	RAL22/0015	30/09/2022	23 Anita Road, BLACKBUTT NORTH	1 into 2
Nanango	RAL22/0026	5/12/2022	163 Bowman Road, BLACKBUTT NORTH	1 into 3
Nanango	RAL22/0021	9/11/2022	4 Gilliland Crescent, BLACKBUTT NORTH	1 into 4
Nanango	RAL23/0009	7/07/2023	118 Gilliland Crescent, BLACKBUTT NORTH	1 into 3
Nanango	RAL21/0011	28/09/2021	175 Blackbutt Crows Nest Road, BLACKBUTT SOUTH	1 into 2
Nanango	RAL23/0005	17/07/2023	43 Brett Road, BLACKBUTT SOUTH	1 into 3
Nanango	RAL22/0020	19/07/2022	411 Haynes Kite Millar Road, BLACKBUTT SOUTH	1 into 2
Kingaroy	RAL20/0008	13/11/2020	96 Siefert Street, CRAWFORD	1 into 3
Nanango	RAL22/0030	6/12/2022	31 Heights Road, GLAN DEVON	1 into 7
Kingaroy	RAL21/0013	14/12/2021	1 Alford Street, KINGAROY	1 into 2

Kingaroy	RAL20/0003	30/06/2020	143 Clark and Swendson Road, KINGAROY	1 into 2
Kingaroy	RAL21/0009	22/10/2021	155-157 Haly Street, KINGAROY	1 into 2
Kingaroy	RAL21/0001	7/07/2021	100-102 Markwell Street, KINGAROY	1 into 5
Kingaroy	RAL21/0025	18/05/2022	42 Prince Street, KINGAROY	1 into 3
Kingaroy	RAL20/0006	8/09/2020	20 Reen Street, KINGAROY	1 into 2
Kingaroy	RAL20/0009	16/11/2020	River Road, KINGAROY	1 into 17
Kingaroy	RAL22/0022	24/01/2023	197 Taylors Road, KINGAROY	1 into 8
Kingaroy	RAL21/0012	18/11/2021	3 Thelma Street, KINGAROY	2 into 3
Murgon	RAL23/0011	12/09/2023	33 Verdelho Drive, MOFFATDALE	2 into 4
Murgon	RAL22/0005	9/11/2022	42 Boat Mountain Road, MURGON	1 into 8
Murgon	RAL22/0041	30/03/2023	64 Boat Mountain Road, MURGON	1 into 2
Murgon	RAL21/0021	4/02/2022	48 Dutton Street West, MURGON	1 into 3
Nanango	RAL22/0007	18/05/2022	7 Appin Street, NANANGO	1 into 2
Nanango	RAL21/0003	5/08/2021	59 Bushnells Road, NANANGO	1 into 2
Nanango	RAL22/0016	27/07/2022	46 Cairns Street, NANANGO	1 into 2
Nanango	RAL22/0003	31/03/2022	285 Carbeen Crescent, NANANGO	1 into 2
Nanango	RAL22/0042	4/09/2023	14503 D'Aguilar Highway, NANANGO	1 into 10
Nanango	RAL22/0018	30/06/2022	15 George Street, NANANGO	1 into 2
Nanango	RAL22/0029	22/12/2022	McGinley Road, NANANGO	1 into 23
Nanango	RAL22/0017	20/12/2022	23-25 Millis Way, NANANGO	1 into 4
Nanango	RAL21/0023	4/02/2022	62 Wickham Street, NANANGO	1 into 2
Nanango	RAL21/0007	30/08/2021	160 Greenwood Creek Road, SOUTH EAST NANANGO	1 into 2
Nanango	RAL21/0008	22/11/2021	Old Esk North Road, SOUTH EAST NANANGO	2 into 6

Kingaroy	RAL21/0018	12/01/2022	358 Boonenne Ellesmere Road, TAABINGA	1 into 2
Kingaroy	RAL21/0002	8/07/2021	5-7 Elizabeth Street, TAABINGA	1 into 2
Kingaroy	RAL23/0006	14/09/2023	46 Kingaroy Burrandowan Road, TAABINGA	1 into 2
Wondai	RAL22/0006	19/07/2022	82 Tingoora Charlestown Road, TINGOORA	1 into 2
Kingaroy	RAL22/0028	8/05/2023	1304 Wattlegrove Road, WATTLE GROVE	1 into 2
Wondai	RAL23/0024	25/10/2023	14 McCord Street, WONDAI	1 into 2

18.4 QUESTION ON NOTICE - WASTE REMOVAL AT BROADMAN ROAD

File Number: **13-12-2023**

Author: **Executive Assistant Liveability**

Authoriser: **Chief Executive Officer**

The following question on notice was received from Councillor Erkens.

Question

Can customer be contacted back regarding a request for waste removal at Broadman Road?

Response

Contact has been made, and is currently ongoing, with the resident in question and the waste collection contractor regarding the feasibility of providing a roadside waste collection service to this address. The address is outside of the defined (or contracted) area, but Officers are working through options to provide this service.

RECOMMENDATION

That the response to the question regarding can customer be contacted back regarding a request for waste removal at Broadman Road raised by Councillor Erkens be received and noted.

ATTACHMENTS

Nil

18.5 QUESTION ON NOTICE - LANDFILL TENDER PROTERRA

File Number: **13.12.2023**

Author: **Executive Assistant Liveability**

Authoriser: **Chief Executive Officer**

The following question on notice was received from Councillor Schumacher.

Question

Are there any long term options for landfill operations, as Proterra is only contracted?

Response

At the November Ordinary Meeting Council resolved to appoint Proterra to undertake landfill maintenance at the Kingaroy, Nanango, Murgon and Wondai landfills. The Question on Notice was seeking to understand what modelling has been undertaken to fund the additional expenditure required for the 2024/25 financial year.

Council also appointed Proterra to provide supervision services to all supervised waste facilities.

This response factors in the increase in budget to the waste operational budget for landfill maintenance and supervision services provided by the contract.

Based off the tendered rates, there is an estimated increase in the operational costs for landfill maintenance and supervision of $842,000.00 for the 2024/25 financial year.

The 2024/25 operational budget will be considered by Council next year, but the shortfall may be met by the following: -

- Increase in revenue from the sale of scrap metal (some site contractors currently retain this income);
- Review of operational sites, whether this relates to site closures or reduction in operational hours;
- Increase in disposal fees for commercial and industrial and construction and demolition waste;
- Efficiencies brought by the introduction of the contract;
- Reallocation of landfill operator;
- Sale of landfill compactor and loader.

RECOMMENDATION

That the response to the question regarding, are there any long term options for landfill operations, as Proterra is only contracted, raised by Councillor Schumacher be received and noted.

ATTACHMENTS

Nil

18.6 QUESTION ON NOTICE - PERISHED TREE IN KUMBIA.

File Number: **13/12/2023**

Author: **Manager Facilities and Parks**

Authoriser: **Chief Executive Officer**

The following question on notice was received from Councillor Henschen.

Question

Is the perished tree in Kumbia being replaced in the near future?

Response

The Kingaroy Parks team will be replacing the perished tree with a Syzygium luehmannii (fine leaf Lilly Pilly) which is a tree species used within the streetscape project.

Council has not been successful in sourcing a Corymbia ficifol (Flowering Gum) at this time.

RECOMMENDATION

That the response to the question regarding Is the perished tree in Kumbia being replaced in the near future raised by Councillor Henschen be received and noted.

ATTACHMENTS

Nil

19 INFORMATION SECTION

Nil

20 CONFIDENTIAL SECTION

OFFICER'S RECOMMENDATION

That Council considers the confidential report(s) listed below in a meeting closed to the public in accordance with Section 254J of the *Local Government Regulation 2012*:

20.1 Murgon Visitor Information Centre

This matter is considered to be confidential under Section 254J - g of the Local Government Regulation, and the Council is satisfied that discussion of this matter in an open meeting would, on balance, be contrary to the public interest as it deals with negotiations relating to a commercial matter involving the local government for which a public discussion would be likely to prejudice the interests of the local government.

20.2 Financial Hardship Rates Application – Assessment Number -23839-10000-000

This matter is considered to be confidential under Section 254J - d of the Local Government Regulation, and the Council is satisfied that discussion of this matter in an open meeting would, on balance, be contrary to the public interest as it deals with rating concessions.

20.3 South Burnett Community Hospital Foundation Limited Board Meeting Minutes - 3 October 2023

This matter is considered to be confidential under Section 254J - g of the Local Government Regulation, and the Council is satisfied that discussion of this matter in an open meeting would, on balance, be contrary to the public interest as it deals with negotiations relating to a commercial matter involving the local government for which a public discussion would be likely to prejudice the interests of the local government.

20.4 Confidential - Mt Wooroolin Reservoir Tender Evaluation

This matter is considered to be confidential under Section 254J - g of the Local Government Regulation, and the Council is satisfied that discussion of this matter in an open meeting would, on balance, be contrary to the public interest as it deals with negotiations relating to a commercial matter involving the local government for which a public discussion would be likely to prejudice the interests of the local government.

21 CLOSURE OF MEETING