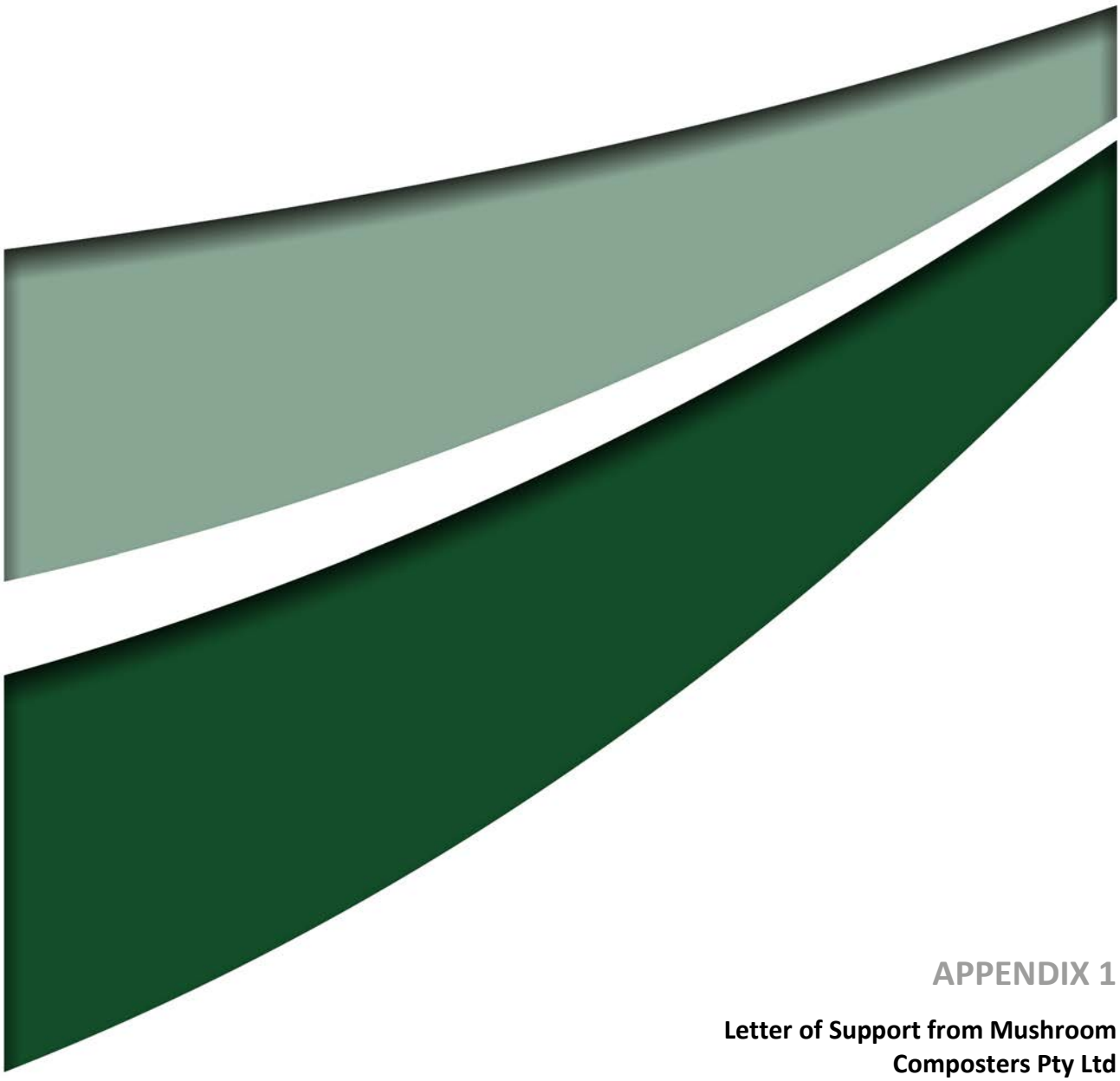


APPENDIX 1

Letter of Support from Mushroom Composters Pty Ltd

"Grow with Confidence"

MUSHROOM COMPOSTERS PTY LTD

A.B.N. 78 001 472 279 A.C.N. 001 472 279

(Postal)
PO Box 706
SINGLETON NSW 2330

(Location)
333 Broke Road
MT THORLEY NSW 2330

(Contacts)
Phone 02 6574 6466
Fax 02 6574 6477

e-mail: mushroomcomposters@idl.com.au

21 June 2016

Secretary
Department of Planning and Environment
23-33 Bridge St
Sydney NSW 2000

Dear Sir/Madam

Development Consent SSD-4960 for the Bulga Optimisation Project
Application for Modification to Eastern Emplacement Area

I refer to Bulga Coal's application to modify Development Consent SSD-4960 for the Bulga Optimisation Project (BOP Consent) and the associated Statement of Environmental Effects (SEE).

Mushroom Composters Pty Ltd has been provided with a copy of the draft SEE and is pleased to support Bulga Coal in its application to modify the layout of the Eastern Emplacement Area.

The revised layout is the outcome of extensive discussions between Mushroom Composters and Bulga Coal, and Mushroom Composters confirms that it is supportive of that layout as it will allow for the continued co-existence of our Stage 1 Mushroom Composting Facility and Bulga Coal's mining activities.

As you are aware, Mushroom Composters and Bulga Coal have jointly developed the Eastern Emplacement Area Management Framework (EEAMF) to regulate the impacts of Bulga Coal's mining activities on our operation, and the framework has now been approved by the Secretary.

In addition, Mushroom Composters and Bulga Coal have entered into a commercial arrangement regarding the revised EEA layout which provides a mechanism for Bulga Coal to purchase the relevant portion of land from the Mushroom Composters.

Mushroom Composters hereby provides its consent to Bulga Coal making the application to modify the EEA layout in the manner described in the SEE.

Mushroom Composters also wishes to confirm that, as a result of the arrangements that have now been put in place with Bulga Coal, all of the matters that were the subject of Mushroom Composters' submissions to the Planning Assessment Commission prior to determination of Development Application SSD 4960 have now been resolved to our satisfaction.

As a result of finalising the EEAMF and entering into these agreements with Bulga Coal, Mushroom Composters no longer considers it necessary for the BOP Consent to contain conditions that relate specifically to the Eastern Emplacement Area and its interaction with the Stage 1 Mushroom Composting Facility and associated land.

Accordingly, Mushroom Composters is supportive of Bulga Coal seeking to have the following aspects of the BOP Consent removed from the approval document.

(a) Schedule 3, condition 18(f);

(b) Schedule 3, condition 19;

(c) Schedule 3, condition 20;

(d) Schedule 3, condition 21;

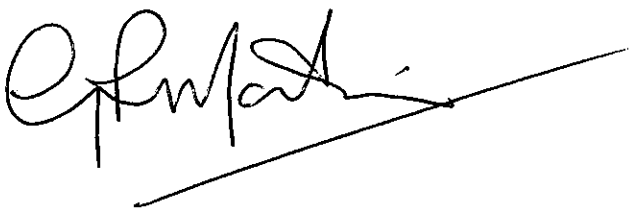
(e) Schedule 3, condition 22(e); and

(f) Appendix 8.

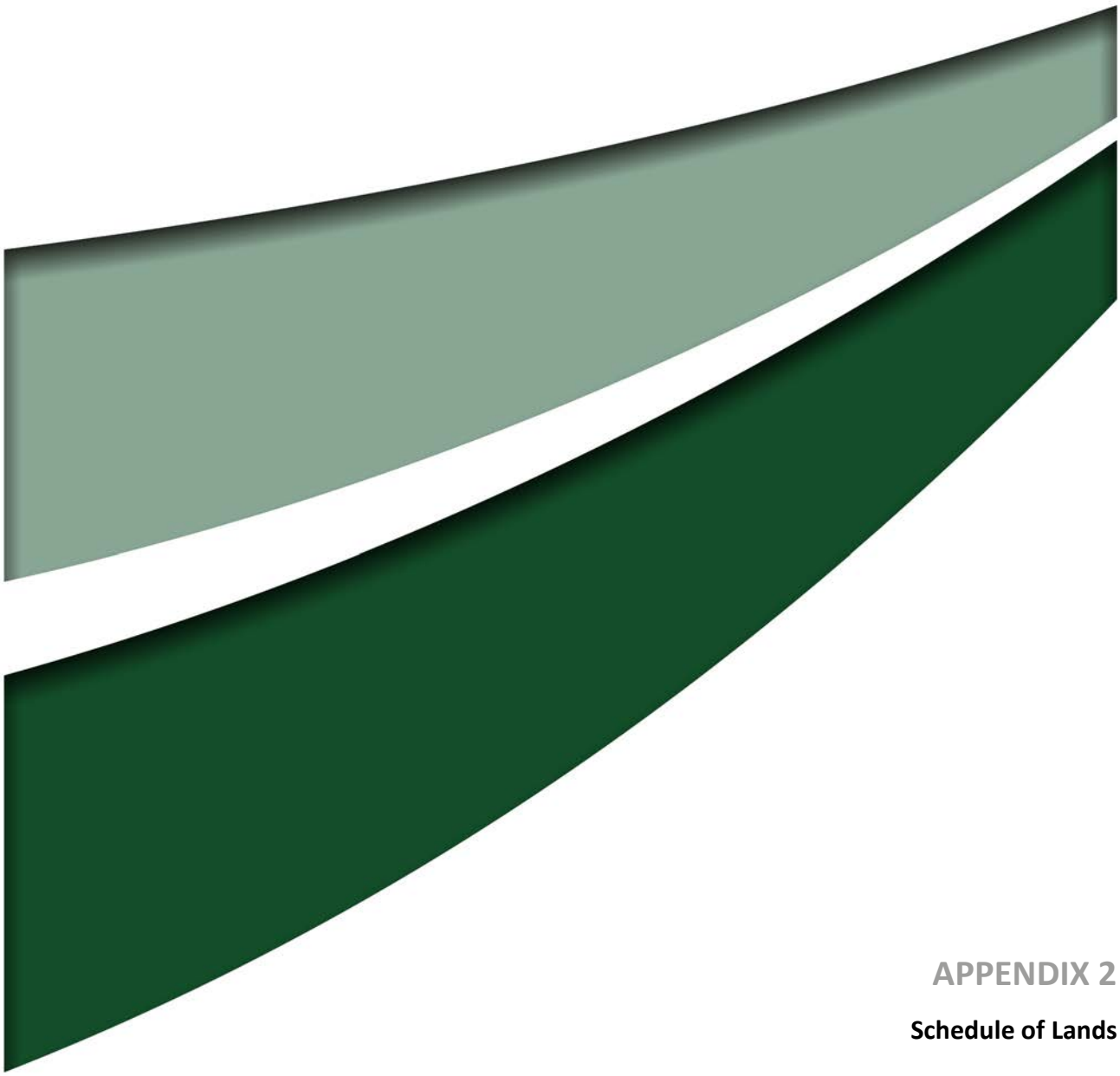
Mushroom Composters is agreeable to this letter being included with Bulga Coal's modification application.

Please do not hesitate to contact me on 0415 542 301 if you would like any more information regarding the above.

Yours sincerely



Dr. Geoff Martin
General Manager
Mushroom Composters Pty Ltd



APPENDIX 2

Schedule of Lands

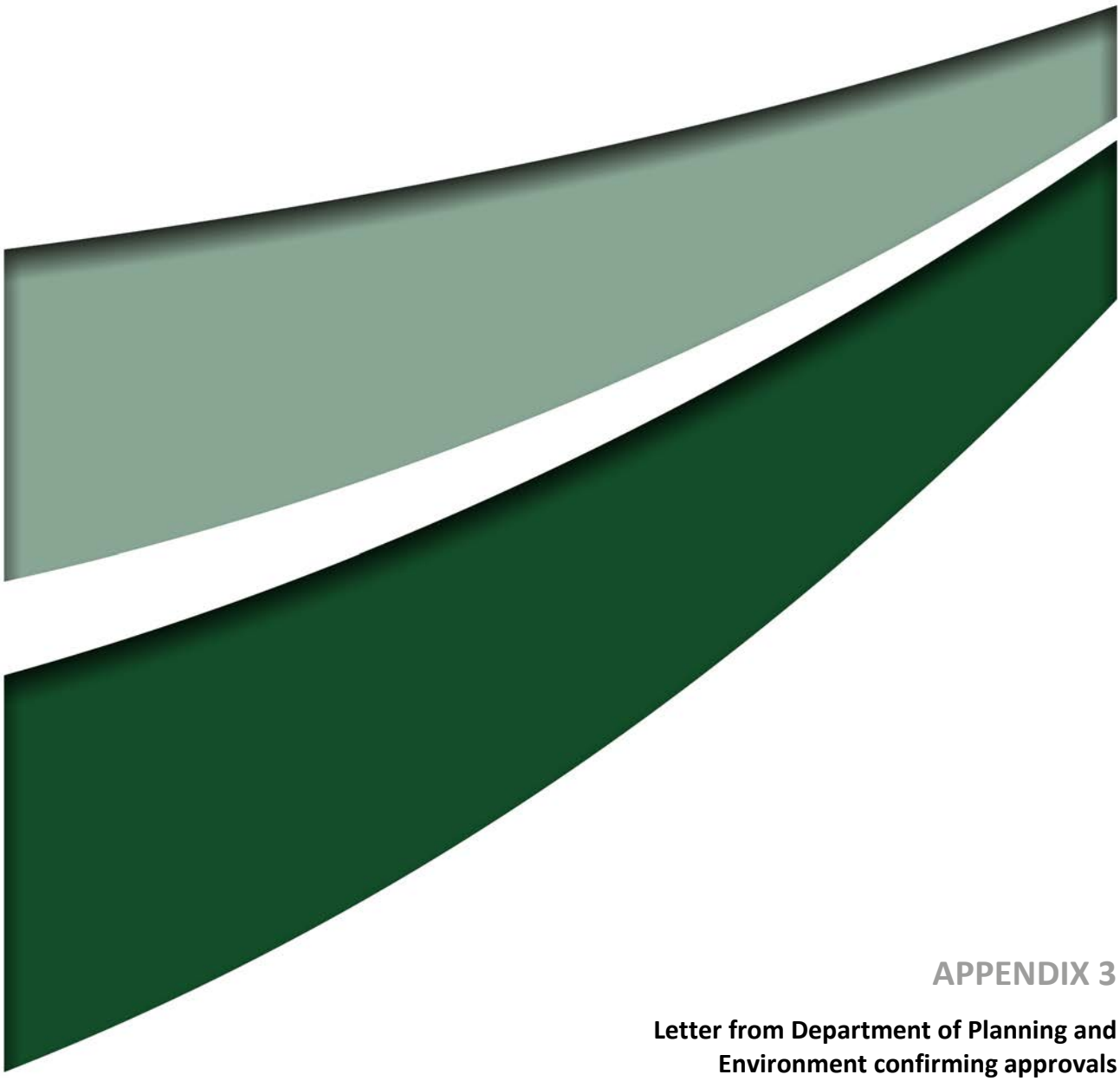
Schedule of Lands

Lot	DP	Owner
25	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
80	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
56	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
2	102103	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
44	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
49	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	563668	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
54	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
35	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	621145	Bulga Coal Management Pty Ltd
61	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
126	729952	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
39	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	376892	Bulga Coal Management Pty Ltd
6	704474	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
22	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	435160	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
46	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	745971	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
50	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
98	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
79	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
29	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
2	133168	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
38	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
82	1006883	Mushroom Composters Pty Ltd
86	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
3	133168	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
14	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
37	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
68	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
75	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
34	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
52	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
15	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
6	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
44	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
3	133135	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
40	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
6	248448	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
B	174788	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
77	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%

Lot	DP	Owner
4	561424	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	133168	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	729923	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
7	704474	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
11	244826	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
43	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
26	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
43	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
45	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
73	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
83	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	136366	Mushroom Composters Pty Ltd
31	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
8	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	102103	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
7	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
81	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
41	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
28	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
105	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
85	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
111	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
7	248448	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	784032	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	133135	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
23	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
10	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
113	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	662301	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
36	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
2	133135	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
5	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
3	561424	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
72	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
51	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
78	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
33	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
A	174788	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
27	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
127	856361	Crown Land
24	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
48	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
12	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
9	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%

Lot	DP	Owner
1	205613	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
74	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
62	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	445449	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	821150	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
109	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
60	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
19	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	1145329	Bulga Coal Management Pty Ltd
2	1143947	Commonwealth of Australia
8	248448	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
5	248448	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
3	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
84	856359	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
11	730762	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
20	263943	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
4	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
10	730762	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
274	260663	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
85	856359	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
271	260663	Miller Pohang Coal Co. Pty Limited
3	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
6	561424	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
82	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
11	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
103	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
13	247398	Bulga Coal Management Pty Ltd
10	244826	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
52	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
125	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
6	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
18	247398	Bulga Coal Management Pty Ltd
53	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
5	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
4	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
16	247398	Saxonvale Coal Pty Limited 97.5% and Nippon Steel Australia Pty Limited 2.5%
76	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
2	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
5	561424	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	247398	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
51	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
17	247398	Lewis, Mrs Laurel
30	755264	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
709	749857	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%

Lot	DP	Owner
852	612261	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	62544	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
2	62544	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	657988	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	47305	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
69	755270	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
191	545559	Bulga Coal Management Pty Ltd
21	811613	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
6	10022	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
192	545559	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
7	10022	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
125	755270	Bulga Coal Management Pty Ltd
17	10022	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
20	811613	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	564480	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
1	171648	Saxonvale Coal Pty Limited 87.5% and Nippon Steel Australia Pty Limited 12.5%
Part Charlton Road		
Part Broke Road		
Various Unnamed Crown Roads		



APPENDIX 3

Letter from Department of Planning and Environment confirming approvals pathway

NSW GOVERNMENT | Planning & Environment

Aaron Worley
Project Manager
Bulga Coal Management Pty Ltd
Private Mail Bag 8
Singleton NSW 2330

Dear Mr Worley

Bulga Optimisation Project – Proposed Modification

I refer to your letter dated 7 December 2015, regarding Bulga Coal Management's (BCM) proposal to lodge an application to modify aspects of the approved Bulga Optimisation Project (SSD 4960), under Section 96(2) of the *Environmental Planning and Assessment Act 1979*.

I understand that BCM has been in consultation with Mushroom Composters and intends to reach a commercial arrangement to purchase a neighbouring portion of Mushroom Composters land and relocate part of the approved Eastern Emplacement Area.

In response to your request, the Department is satisfied with BCM's proposal to focus its environmental assessment on the potential impacts of the proposed Eastern Emplacement Area and use contemporary baseline data from its Environmental Impact Statement for the Bulga Optimisation Project to supplement and/or inform its assessment of the modification impacts.

Notwithstanding, BCM will be required to update relevant technical studies (including air quality, noise and surface water modelling/assessments) to meet contemporary assessment standards and ensure that any changes in impacts under the modification are clearly identified.

With respect to biodiversity, I understand the modification is seeking to substitute areas of approved and proposed vegetation clearance. The Department is amenable to BCM's proposal to provide a comparative assessment of the net change in species and communities to be cleared under the modification, with any net additional impacts to be appropriately offset.

However, as the transitional period for the NSW *Biodiversity Offsets Policy for Major Projects* commenced on 1 October 2014, BCM will need to assess any additional offsets required under the modification against the 'Framework for Biobanking Assessment' (FBA). The Department understands that, with minimal additional work, BCM's existing ecological surveys would be sufficient to inform an FBA assessment of any additional offset requirements.

All other matters should be assessed to a sufficient level of detail to inform an assessment of relative changes under the modification, including the scale of any increased impacts.

If you have any queries regarding the above, please contact Mr Matthew Sprott, A/Team Leader – Resource Assessments, on (02) 9228 2054.

Howard Reed

Howard Reed 10-12-15
Director
Resource Assessments

APPENDIX 4

Air Quality Assessment

Bulga Surface Operations Eastern Emplacement Area Modification

Bulga Coal Management Pty Ltd

Air Quality Impact Assessment

Final

22 June 2016

Umwelt (Australia) Pty Ltd Reference 2869

Bulga Surface Operations Eastern Emplacement Area Modification

Project No:	IA103000
Document Title:	Air Quality Impact Assessment
Document No.:	Final
Revision:	Revision 0
Date:	22 June 2016
Client Name:	Bulga Coal Management Pty Ltd
Client No:	Umwelt (Australia) Pty Ltd Reference 2869
Project Manager:	Shane Lakmaker
Author:	Shane Lakmaker
File Name:	J:\IE\Projects\04_Eastern\IA103000\Deliverables\IA103000_Bulga EEA Mod_Jacobs_AQIA_Final.docx

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Document history and status

Revision	Date	Description	By	Review	Approved
D1R0	16/2/16	Draft report	SL	MP	JM
D2R0	29/2/16	Draft report, updated with Umwelt comments	SL	-	-
D3R0	13/4/16	Draft report	SL	-	-
D4R0	7/6/16	Final draft	SL	-	-
Final	22/6/16	Final	SL	-	JM

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Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is to quantify the potential air quality impacts of a proposed modification to the Eastern Emplacement Area at Bulga Mine in accordance with the scope of services set out in the contract between Jacobs and the Client. That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the Client (if any) and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs's Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

This report has been prepared by Jacobs Group (Australia) Pty Ltd (Jacobs) for Bulga Coal Management Pty Ltd (BCM). Its purpose is to provide an assessment of the potential air quality impacts associated with a proposed change to the design of the Eastern Emplacement Area (EEA) which was approved as part of the Bulga Optimisation Project.

This assessment was carried out by reviewing the nature and scale of the proposed changes, identifying the key air quality issues to be addressed, and quantifying the potential impacts. This assessment has also considered recently completed activities which have addressed relevant conditions in the Development Consent (SSD-4960). The main objective of the assessment was to determine the potential change in air quality as a result of the modified EEA proposal.

1.1 Background

Approval for the Bulga Optimisation Project was granted by the NSW PAC on 1 December 2014. The Development Consent (SSD-4960) prescribed the conditions of approval for the Project including conditions relating to the proposed Eastern Emplacement Area (EEA).

Among other conditions, the Development Consent required (from Condition 19) the preparation of an Eastern Emplacement Area Management Framework (EEAMF). The purpose of this framework is to outline the way in which dust emissions from the EEA will be managed in order to minimise air quality impacts on the adjacent mushroom composting facility (MCF).

A Technical Review Committee (TRC) was established, as per Condition 20 of the Development Consent, to oversee the management of air quality impacts on the MCF and to agree on the actions for completing the EEAMF. The TRC was established in early 2015 and comprised of representatives from Mushroom Composters, BCM, and an independent air quality expert (Dr Nigel Holmes).

In 2015 the TRC met approximately monthly to address Conditions 19 and 20 of the Development Consent. Condition 19 required additional air dispersion (air quality) modelling to be carried out for the Bulga Coal Complex (BCC). The main objective for the additional modelling was to inform the development of the EEAMF.

The EEAMF was completed in January 2016 and, as noted above, has been informed by results from a revised air dispersion model that was developed for the BCC. The air dispersion model has been considered in this current assessment of the proposed modification to the EEA design.

1.2 Objectives

The main objectives of this assessment were to:

- Identify potential air quality issues that may be associated with the modified EEA;
- Quantify potential air quality impacts; and
- Identify suitable air quality management measures, as appropriate, to minimise impacts.

2. Project Description

BCM proposes a change to the design of the EEA, approved as part of the Bulga Optimisation Project. The proposed modification relates only to the design of the EEA. **Figure 1** shows the indicative design of the amended EEA which is the subject of the proposed modification. The Stage 1 Composting Facility, located on the Mushroom Composters land, will remain under the modified EEA design.

Table 1 shows the aspects of the existing approved development that will be modified by the proposed modification. Parts of the northern section of the approved EEA will no longer be constructed as a result of the modified EEA design.

Table 1 Summary of Proposed Modified Development

Approved Development Component	Proposed Modified Development
Mining areas	No change
Mining methods	No change
Production rates	No change
Open cut mining infrastructure area	No change
Eastern Emplacement Area	Design as shown in **Figure 1**. No change to emplacement schedule as described in the Revised and Amended Project Report.
Noise and visual bund	No change
Underground infrastructure	No change
Public roads	No change
Tailings and rejects strategy	Additional tailings storage facility located within the confines of the existing mining operation, no change to disturbance area. Not relevant to air quality.
External coal transport infrastructure	No change
Electricity infrastructure	No change
Pipelines and other services infrastructure	No change

Air quality issues can arise when emissions from an industry or activity lead to deterioration in the ambient air quality. Changes to air emissions and potential impacts associated with the proposed modification may result from:

- Changes to the haul distances;
- Changes to the extent of exposed areas; and
- Changes to the proximity of emission sources to sensitive receptors.

The key issue to be addressed is whether the changes in emissions, due to the items above, are likely to affect the area of impact as defined by the approved Bulga Optimisation Project. In addition, specific consideration of potential impacts at the location of the MCF is required, due to the proximity of this facility to the proposed EEA.

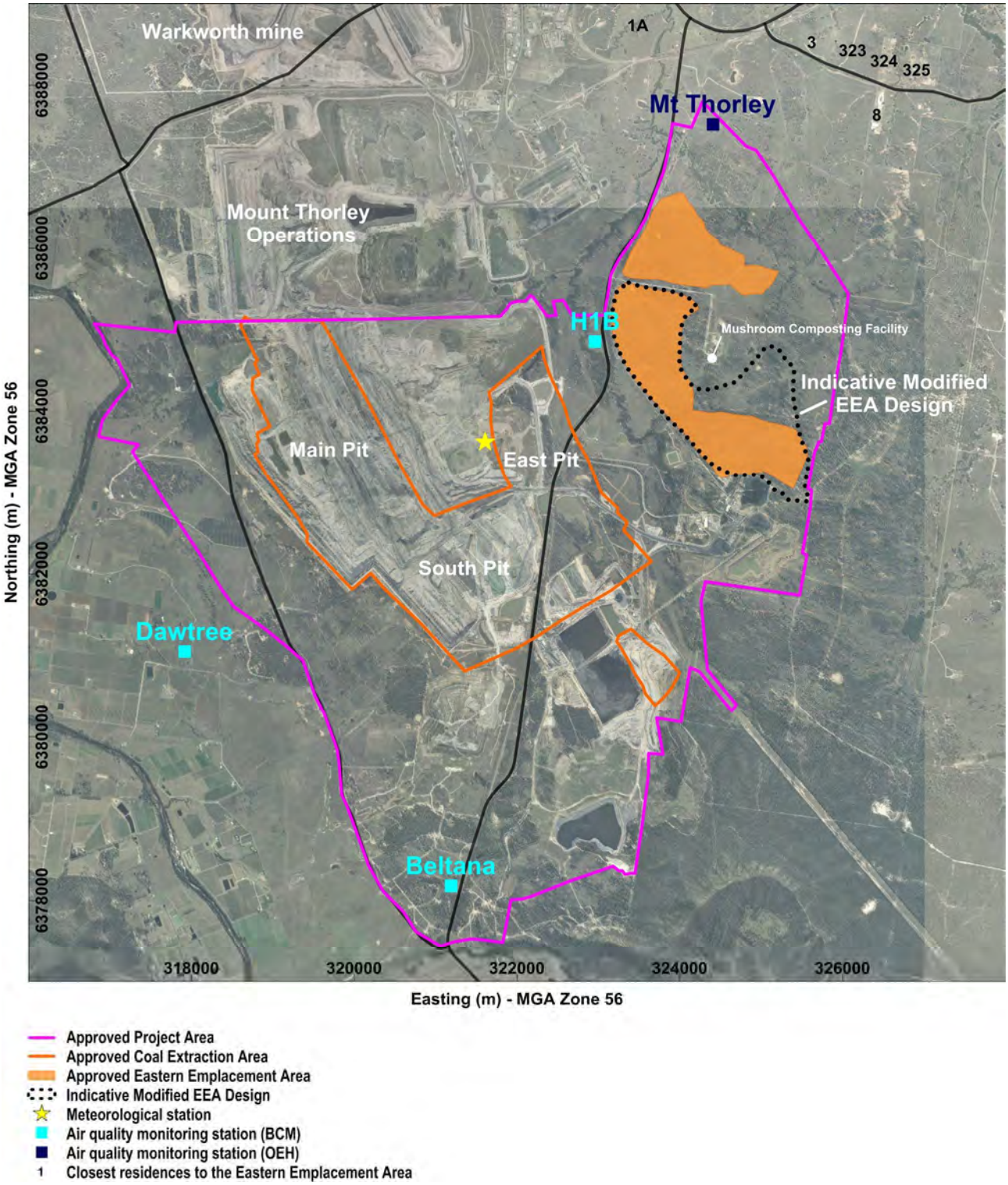

Figure 1 Proposed modifications to the EEA design

3. Approach to Assessment

3.1 Overview

The assessment of potential air quality impacts as a result of the proposed EEA design modification has been carried out by:

- Estimating and comparing dust emissions from two scenarios, namely (1) BCC without the proposed EEA modification, and (2) BCC with the proposed EEA modification. The emission calculations for both of these scenarios have considered the inventory updates that were completed by the TRC since the Development Consent (SSD-4960) was issued. The worst case year in terms of potential emissions was selected. Scenario 1 and 2, as defined above, have been referred to as the "Approved" and "Modified" EEA scenarios respectively.
- Comparing the emissions from the two scenarios listed above and inferring any changes in emissions to changes in off-site air quality at monitored locations and sensitive receptors. The inferred changes to off-site air quality have been used to determine the potential changes in the existing PM_{10} concentrations, since PM_{10} has been the particulate matter classification that has defined the potential extent of impacts.
- Running an air dispersion model, CALPUFF, for the BCC, without and with the proposed EEA modification to predict potential impacts at the MCF. The potential change in air quality impacts at private properties to the north of the EEA (see **Figure 1** for locations) have also been determined from this model.

3.2 Emissions

The most significant emission to air from the BCC is dust (particulate matter) due to material handling, material transport, processing, wind erosion, and blasting. Estimates of these emissions are required for the analysis, and for the dispersion model used to estimate impacts at the MCF. Total dust emissions have been estimated by analysing the material handling schedule, equipment listing and mine plans and identifying the location and intensity of dust generating activities. Operations have been combined with emissions factors developed both locally and by the US EPA.

The emission factors used for this assessment have been drawn largely from the following sources:

- *Emission Estimation Technique Manual for Mining* (NPI, 2012); and
- AP 42 (US EPA, 1985 and updates).

The process for developing BCC emission estimates involved:

- Confirming the mine plan and material handling quantities with BCM.
- Updating the Bulga Optimisation Project Revised and Amended Project – Air Impact Assessment Report (Revised Project Report) dust (PM_{10}) emissions inventory for the BCC in line with the recommendations of the TRC and including:
  - Silt and moisture content assumptions for the haul roads.
  - Topographical information for the EEA.
  - Resolution of the modelled sources to represent the proposed activities.
  - Dumping scenarios to minimise impacts at the MCF.
- Preparing inventories for Year 3, which represented the highest material handling quantities case, for approved and modified EEA scenarios.

3.3 Meteorological Modelling

The CALPUFF air dispersion model requires information on the local topography, land use and meteorological conditions in the modelled region. This information was generated by the meteorological pre-processor, CALMET, using surface observation data from local weather stations and upper air data from the CSIRO's prognostic model known as TAPM (The Air Pollution Model). The result of the CALMET simulation was a year-long (2014), three-dimensional output of meteorological conditions that was used as input to CALPUFF.

Development of the meteorological component of the model (CALMET) involved:

- Obtaining DTM and mine plan information for the BCC without and with the proposed EEA modification from BCM.
- Determining the appropriate grid domain and resolution to be used.
- Preparing the topographical and land use data for CALMET.
- Obtaining a historical meteorological dataset from BCM from the main Complex weather station.
- Checking that the selected year was representative of long-term meteorological conditions by comparing annual and seasonal wind-roses with patterns for at least two other years.
- Running TAPM for the selected year and comparing TAPM wind-roses to the measured data to identify any differences.
- Preparing the CALMET surface data meteorological file, supplemented with TAPM data for other variables not collected by the weather station.
- Running CALMET in observations mode.

Key model settings for TAPM are shown below in **Table 2**. All settings represent the final agreed settings by the TRC.

Table 2 Model settings and inputs for TAPM

Parameter	Value(s)
Model version	4.0.5
Number of grids (spacing)	5 (30 km, 10 km, 3 km, 1 km, 300m). Output from 1 km grid used.
Number of grids point	30 x 30 x 25
Year(s) of analysis	2014, with one "spin-up" day.
Centre of analysis	BCC (32°41' S, 151°6' E)
Terrain data source	Shuttle Radar Topography Mission (SRTM); NASA (2015)
Land use data source	Default
Meteorological data assimilation	BCC meteorological station. Radius of influence = 10 km. Number of vertical levels for assimilation = 4

Table 3 lists the model settings and input data for CALMET.

Table 3 Model settings and inputs for CALMET

Parameter	Value(s)
Model version	6.334
Terrain data source(s)	SRTM and Project Digital Elevation Model (DEM)
Land-use data source(s)	Digitized from aerial imagery
Meteorological grid domain	12 km x 12 km
Meteorological grid resolution	0.3 km
Meteorological grid dimensions	40 x 40 x 9
Meteorological grid origin	316000 mE, 6377000 mN
Surface meteorological stations	BCC meteorological station - Observations of wind speed, wind direction, temperature and relative humidity - TAPM for ceiling height, cloud cover and air pressure
Upper air meteorological stations	Upper air data file for the location of BCC meteorological station derived by TAPM
Simulation length	8760 hours (1 Jan 2014 to 31 Dec 2014)
R1, R2	0.5, 1
RMAX1, RMAX2	5, 20
TERRAD	5

Terrain information was extracted from the SRTM database which has global coverage at approximately 90 metre resolution (in addition to the Project DEM). Land use data were extracted from aerial imagery. **Figure 2** shows the model grid, land-use and terrain information, as used by CALMET.

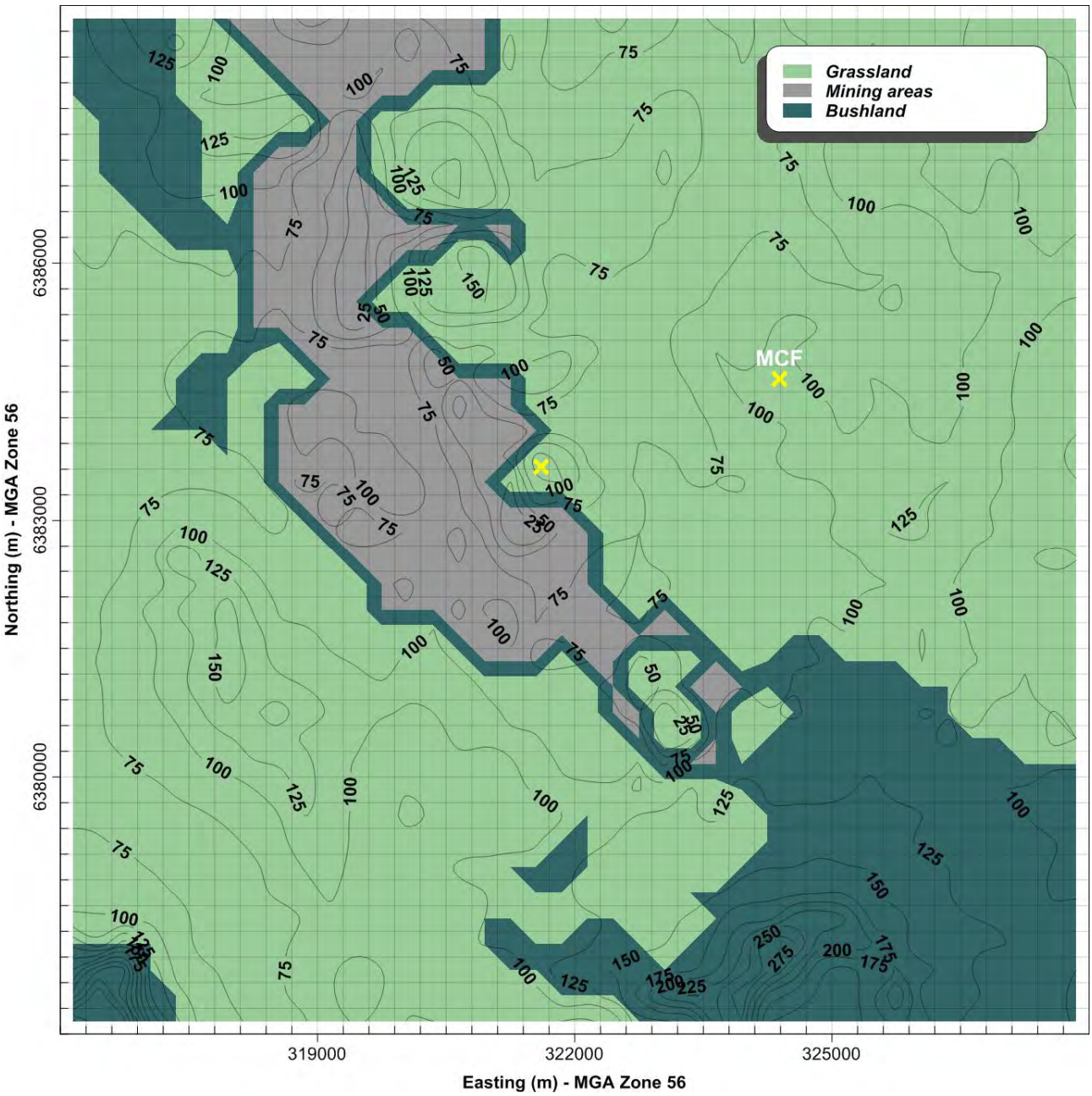

Figure 2 Model grid, land-use and terrain information

Figure 3 shows a snapshot of winds as simulated by the CALMET model under stable conditions. This plot shows the effect of the topography on local wind flows (for this particular hour), and highlights the non-uniform wind patterns in the area.

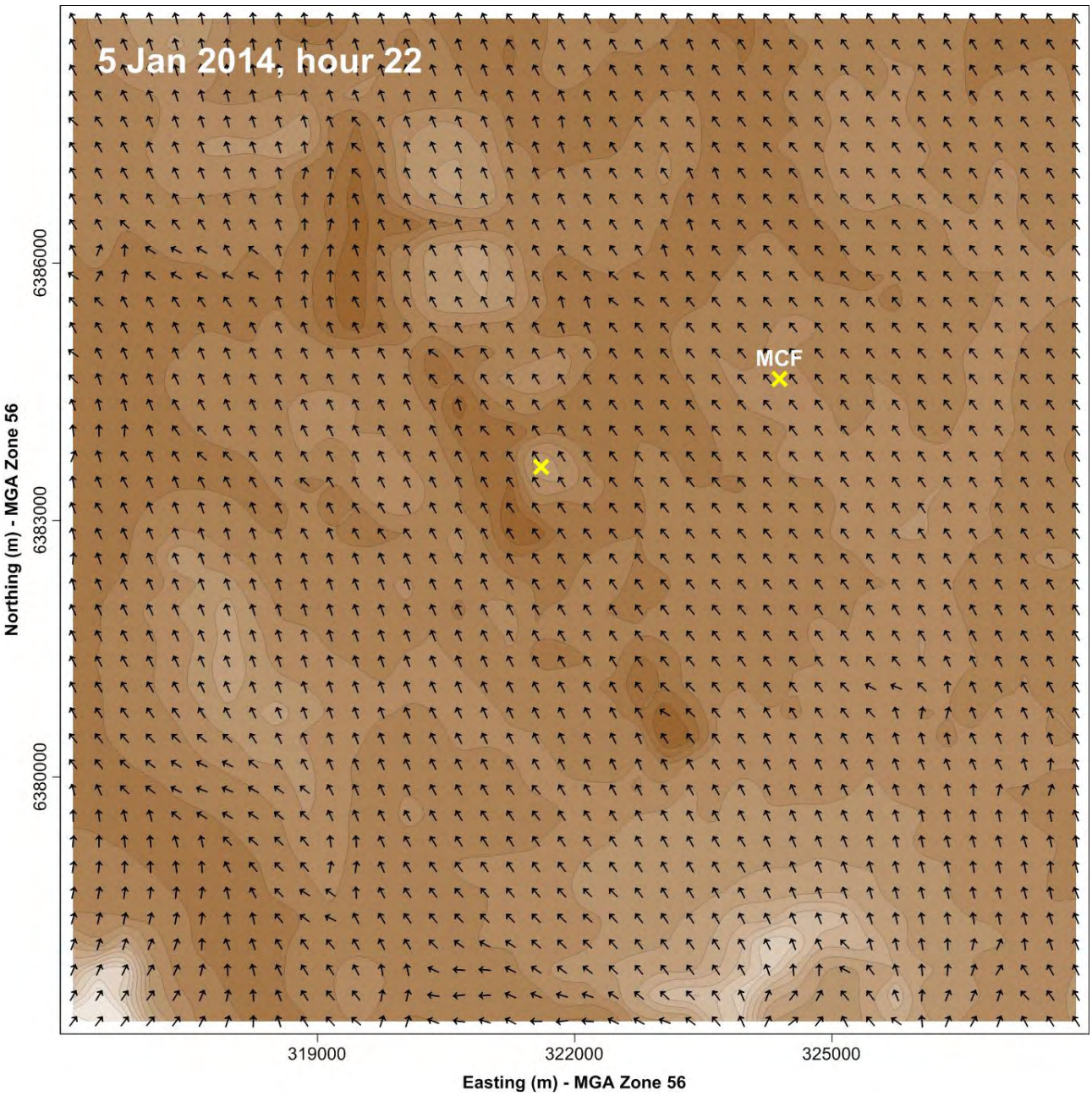

Figure 3 Example of CALMET simulated ground-level wind flows

3.4 Dispersion Modelling

PM_{10} concentrations due to emissions from BCC, including the EEA, have been predicted using CALPUFF Version 6.42. The modelling was performed using emission estimates as described in **Section 3.2** and using the meteorological information provided by the CALMET model, described in **Section 3.3**. Predictions were made at the location of the MCF (MGA Zone 56 easting 324.393 km and northing 6384.649 km) and selected private properties to the north of the EEA (refer to **Figure 1** for the locations), being the nearest private residences to the EEA.

Mining operations were represented by a series of volume sources located according to the location of activities for each modelled scenario. **Figure 4** and **Figure 5** show the location of the modelled sources, where the emissions from each dust generating activity were assigned to one or more of these source locations.

Dust emissions for all modelled mine-related sources have been characterised to fit in one of three categories, as follows:

- Wind insensitive sources, where emissions do not vary with wind speed (for example, dozers).
- Wind sensitive sources, where emissions vary with the hourly wind speed, raised to the power of 1.3, a generic relationship published by the US EPA (1987). This relationship has been applied to sources such as loading and unloading of waste to/from trucks and results in increased emissions with increased wind speed.
- Wind sensitive sources, where emissions also vary with the hourly wind speed, but raised to the power of 3, a generic relationship published by Skidmore (1998). This relationship has been applied to sources including wind erosion from stockpiles, overburden dumps or active pits, and results in increased emissions with increased wind speed.

Emissions from each volume source were developed on an hourly time step, taking into account the level of activity at that location and, in some cases, the hourly wind speed. This approach ensured that light winds corresponded with lower dust generation and higher winds, with higher dust generation.

Blasting activities and associated emissions were assumed to take place only during daylight hours (9 am to 5 pm for the purposes of the modelling) while all other activities have been modelled for 24 hours per day.

Pit retention (that is, retention of dust particles within the open pits) has been included in the model simulations. The pit retention calculation determines the fraction of dust emitted in the pit that may escape the pit. The "escaped fraction" is a function of the gravitational settling velocity of the particles and the wind speed and is shown by the following relationship (US EPA, 1995).

Equation 1:

$$\varepsilon = \frac{1}{\left(1 + \frac{v_g}{(\alpha U_r)}\right)}$$

where:

ε = escaped fraction for the particle size category

V_g = gravitational settling velocity (m/s)

U_r = approach wind speed at 10 m (m/s)

α = proportionality constant in the relationship between flux from the pit and the product of U_r and concentration in the pit (0.029)

To model the effect of pit retention, the emissions from mining sources within the open pits have been reduced as per the calculation above for each hour of the simulation depending on the wind speed. This approach means that much of the coarser dust would remain trapped in the pits. Typically five per cent of the PM_{10} emissions are trapped in the pit using this calculation.

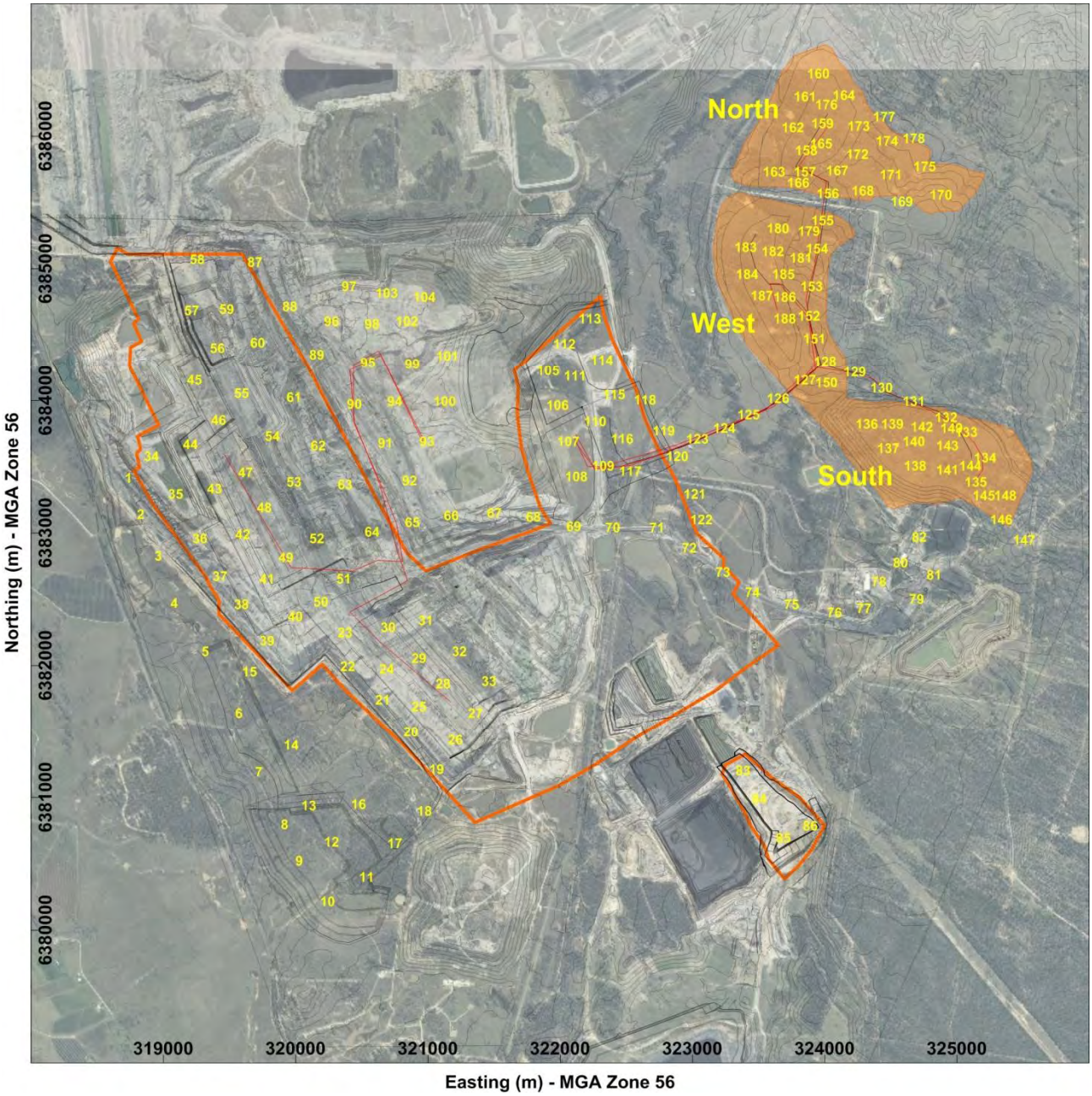

Figure 4 Location of modelled sources for Year 3 as approved

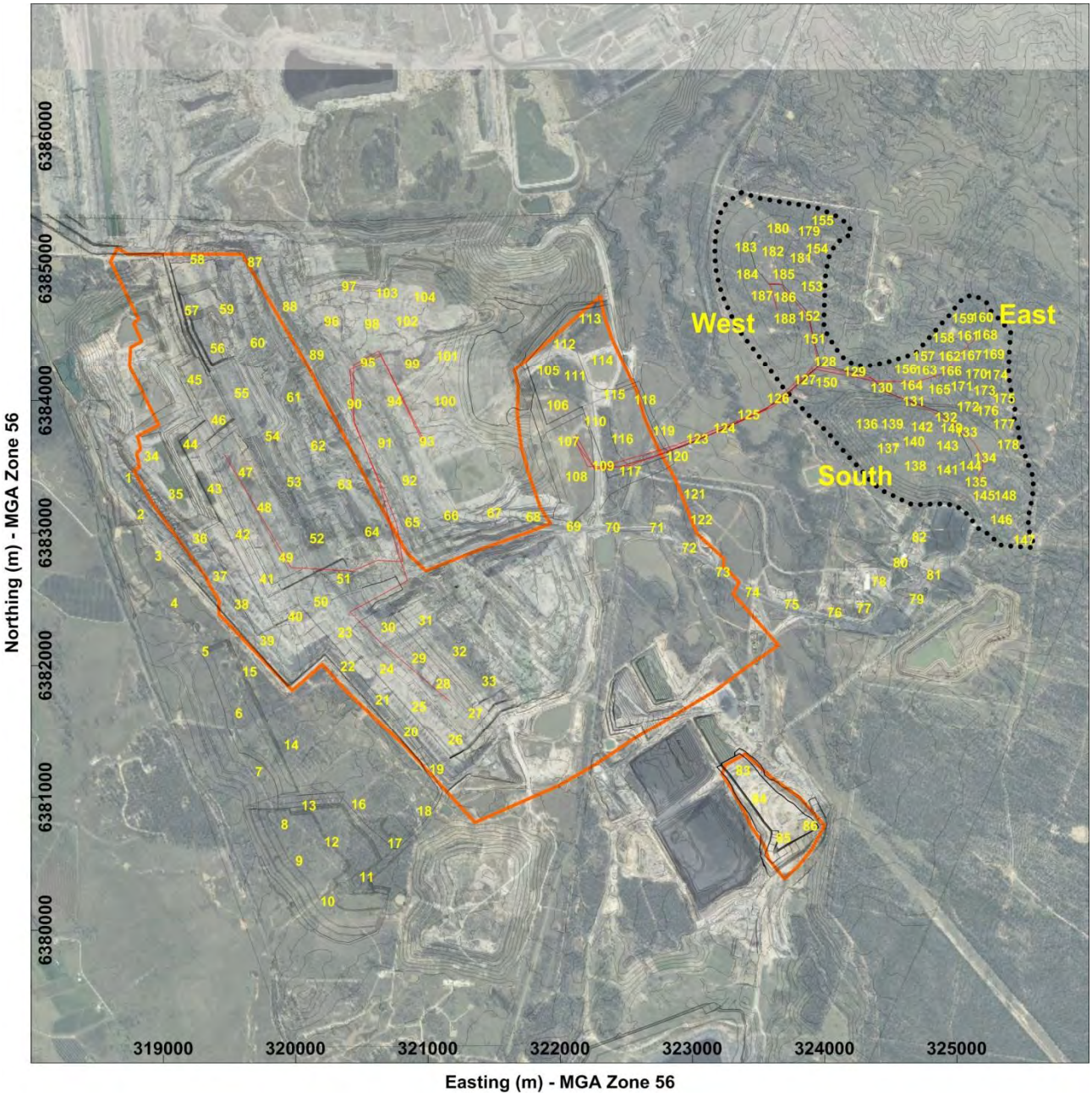

Figure 5 Location of modelled sources for Year 3 as proposed

Key model settings and inputs for CALPUFF are provided in **Table 4**.

Table 4 Model settings and inputs for CALPUFF

Parameter	Value(s)
Model version	6.42
Computational grid domain	96 x 80
Chemical transformation	None
Dry deposition	Yes
Wind speed profile	ISC rural
Puff element	Puff
Dispersion option	Turbulence from micrometeorology
Time step	3600 seconds (1 hour)
Terrain adjustment	Partial plume path
Number of volume sources	178. See Figure 4 and Figure 5
Number of discrete receptors	1 (MCF)

The model predictions at the MCF and private properties to the north were then compared with the relevant air quality assessment criteria.

3.5 Background Levels

A detailed review of the existing air quality, and background levels, was presented in the EIS and Revised and Amended Project Report (revised project). The current assessment provides only a brief summary of the existing air quality outcomes from the EIS and Revised Project Report since, as noted in **Section 1**, the main objective of this assessment was to determine the potential change in air quality as a result of the modified EEA proposal.

Figure 6 provides a summary of the existing air quality in the vicinity of BCC, in terms of annual average PM_{10} concentrations. In summary, PM_{10} concentrations for the past four years have complied with the EPA's 30 µg/m^3 criterion for annual average PM_{10}. In addition, BCC has not reported any exceedances of the EPA's 50 µg/m^3 24-hour average criterion, due to BCC, in the past four years.

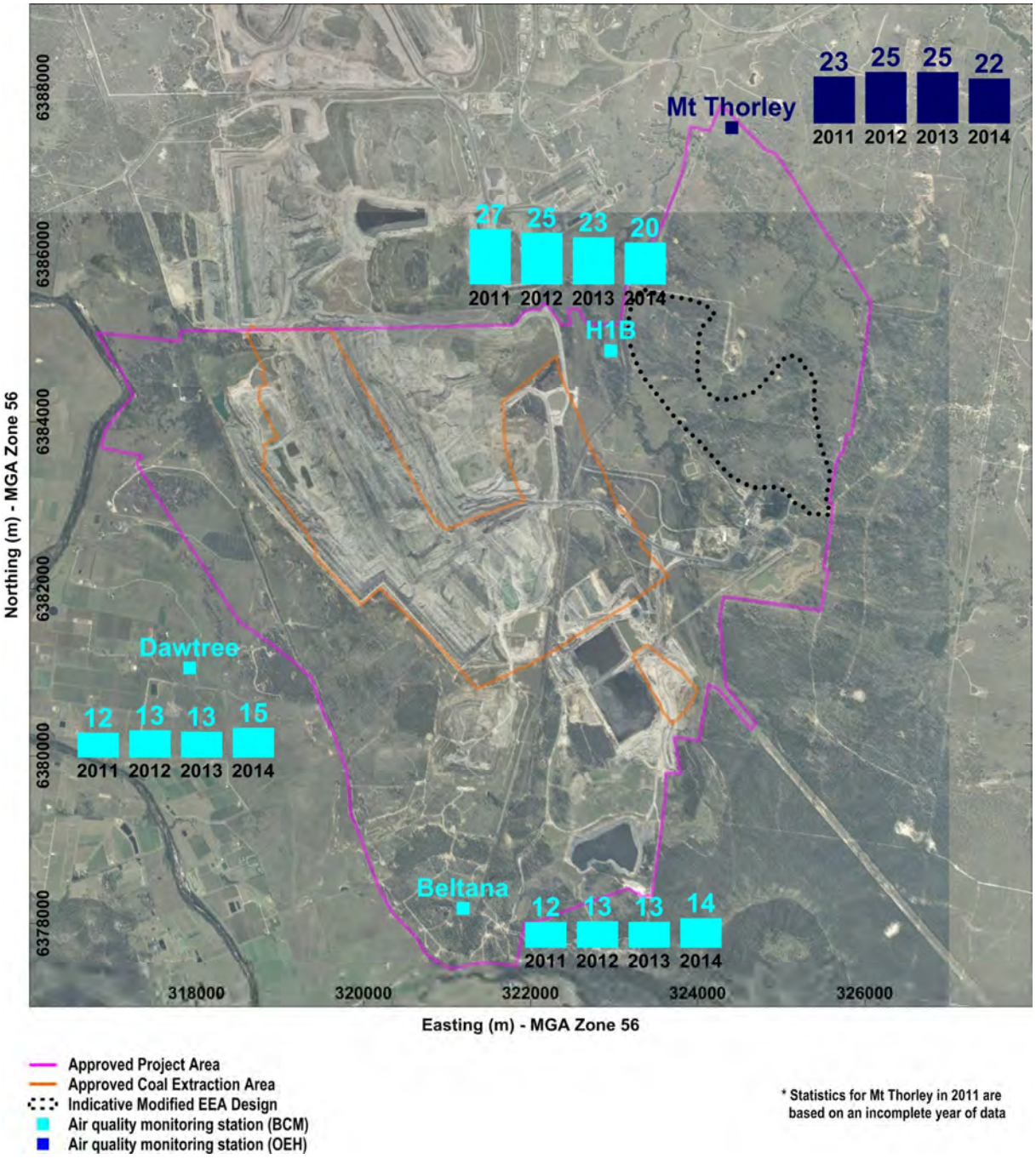

Figure 6 Measured annual average PM_{10} concentrations in the vicinity of BCC (µg/m^3)

For the detailed assessment of potential impacts at the MCF and private properties, background levels were added to the model predictions. This involved:

- Obtaining PM_{10} monitoring data from the OEH's Mt Thorley monitoring site for 2014.
- Predicting the contribution of the 2014 activities at the BCC to monitored PM_{10} concentrations at the Mt Thorley site.
- Subtracting the predicted contribution of the BCC from the monitoring data.
- Adding the derived Mt Thorley background (less the existing BCC contribution) to the model predictions for future operations.

3.6 Assessment Criteria

Air quality is quantified by the concentrations of air pollutants in the ambient air, where an air pollutant is a substance that is known to cause health, nuisance and/or environmental effects. With regard to human health and nuisance effects, the air pollutant most relevant to the Project would be particulate matter, and in particular, PM_{10}.

The EPA has set air quality criteria for many air pollutants including PM_{10}. Most of the EPA criteria, which are published in the "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" (DEC 2005), apply to existing and potential sensitive receptors such as residences, schools and hospitals. In addition the TRC, as part of the process for addressing Condition 19 of the Development Consent, established a PM_{10} assessment criteria specifically for the MCF. **Table 5** shows the relevant air quality assessment criteria.

Table 5 Relevant air quality assessment criteria

Air quality indicator	Averaging time	Criterion	Notes
Particulate matter (PM_{10})	24-hour	50 µg/m^3	EPA. Applies to sensitive receptors.
	Annual	30 µg/m^3	EPA. Applies to sensitive receptors.
Particulate matter (PM_{10}) at the MCF	13-hour (6 am to 7 pm)	91 µg/m^3	TRC. Applies to the MCF.

4. Results

4.1 Changes to Emissions

Table 6 shows the estimated annual PM_{10} emissions due to the BCC for approved and proposed scenarios. The calculations have included the recommendations of the TRC to address Condition 19 of the Development Consent relating to modelling, and are based on recent material handling quantities provided by BCM. Emissions were estimated for both Year 3 and 4. Year 3 estimates were found to be higher, due to the material handling quantities, so have been used for the assessment, for conservatism.

Table 6 Estimated PM_{10} emissions due to the BCC

Activity	Annual PM_{10} emissions (kg/y)		
	Year 4 from Revised and Amended Project Report	Year 3 approved, including TRC recommendations	Year 3 proposed, including TRC recommendations
Stripping topsoil (dozers)	12,308	16,036	16,036
OB - Drilling in Main Pit	2,154	0	0
OB - Drilling in East Pit	1,442	1,290	1,290
OB - Drilling in South Pit	1,691	1,952	1,952
OB - Blasting in Main Pit	23,075	0	0
OB - Blasting in East Pit	15,450	24,333	24,333
OB - Blasting in South Pit	18,111	24,545	24,545
OB - Dragline emplacing OB	44,646	55,733	55,733
OB - Sh/Ex/FELs loading OB to trucks from Main pit	27,447	0	0
OB - Sh/Ex/FELs loading OB to trucks from Eastern pit	24,036	84,435	84,435
OB - Sh/Ex/FELs loading OB to trucks from Southern pit	28,176	58,730	58,730
OB - Hauling OB from Main Pit to Main OB	310,647	0	0
OB - Hauling OB from South Pit to Main OB	14,169	0	0
OB - Hauling OB from Main Pit to Bund	227,874	345,057	345,057
OB - Hauling OB from East Pit to EEA (north / east) or	390,394	435,526	365,012
OB - Hauling OB from East Pit to EEA (west) or		321,459	321,459
OB - Hauling OB from East Pit to EEA (south)		394,047	394,047
OB - Emplacing OB from Main Pit to Main OB	43,891	0	0
OB - Emplacing OB from South Pit to Main OB	3,573	0	0
OB - Emplacing OB from Main Pit to Bund (southwest OB)	28,176	58,730	58,730
OB - Emplacing OB from East Pit to EEA (north / east) or	24,036	84,435	84,435
OB - Emplacing OB from East Pit to EEA (west) or		84,435	84,435
OB - Emplacing OB from East Pit to EEA (south)		84,435	84,435
OB - Dozers on OB in Main overburden emplacement area	4159	0	0
OB - Dozers on OB in Bund	1,040	46,277	46,277
OB - Dozers on OB in EEA (north / east) or	2,079	46,277	46,277
OB - Dozers on OB in EEA (west) or		46,277	46,277
OB - Dozers on OB in EEA (south)		46,277	46,277
OB - Dozers on OB working on rehabilitation	1,040	34,708	34,708
CL - Drilling in Main Pit	103	0	0
CL - Drilling in South Pit	40	0	0
CL - Drilling in East Pit	65	0	0

Activity	Annual PM_{10} emissions (kg/y)		
	Year 4 from Revised and Amended Project Report	Year 3 approved, including TRC recommendations	Year 3 proposed, including TRC recommendations
CL - Blasting in Main Pit	530	0	0
CL - Blasting in South Pit	208	0	0
CL - Blasting in East Pit	336	0	0
CL - Dozers ripping/pushing/clean-up on Main Pit	39,498	36,210	36,210
CL - Dozers ripping/pushing/clean-up East Pit	16,928	36,210	36,210
CL - Loading OC ROM coal from Main pit to trucks	63,991	70,098	70,098
CL - Loading OC ROM coal from East pit to trucks	27,425	27,303	27,303
CL - Hauling OC ROM coal from Main pit to open cut ROM pad	166,883	115,528	115,528
CL - Hauling OC ROM coal from East pit to open cut ROM pad	21,529	20,036	20,036
CL - Unloading OC ROM coal to dump hopper at open cut ROM pad	13,712	6,575	6,575
CL - Unloading OC ROM coal to open cut ROM pad	9,333	4,200	4,200
CL - Loading OC ROM coal at OC ROM pad (rehandle)	9,333	4,200	4,200
CL - Conveyer OC ROM coal to CHPP ROM Pad	403	967	967
CL - Conveyor unloading OC ROM coal to CHPP	168	403	403
UG - Conveyor to Blakefield South ROM pad (underground system)	0	0	0
UG - Conveyor unloading to dump hopper at ROM pad	163	316	316
UG - ROM hopper unloading coal to overland conveyor	0	0	0
UG - Conveyor to CHPP ROM pad	390	757	757
UG - Conveyor unloading to CHPP	163	316	316
UG - Dozers at UG stockpile	20,793	18,105	18,105
CL - Dozers at CHPP (stockpiles)	22,341	18,105	18,105
CL - Dozers at CHPP Product stockpiles	13,899	22,529	22,529
CL - Handling coal at CHPP	2,740	4,879	4,879
CL - Conveyer to product stockpiles	322	911	911
CL - Conveyor unloading to product stockpiles	134	379	379
CL - Loading product coal from stockpiles to trains	1,074	3036	3,036
WE - Active pits	760,280	228,778	228,778
WE - Active dumps	979,525	149,077	149,077
WE - EEA North / East		19,456	14,982
WE - EEA West		19,008	19,008
WE - EEA South		27,239	27,239
WE - Open Cut ROM Pad	3,592	898	898
WE - CHPP ROM Pad	3,154	788	788
WE - Product stockpile	7,884	1971	1,971
WE - Blakefield South stockpile	2,102	526	526
Grading roads	27,525	28,175	28,175
Total (assuming dumping to EEA north / east for full year)	**3,466,180**	**2,185,042**	**2,110,054**
Total (assuming dumping to EEA west for full year)		**2,070,976**	**2,066,501**
Total (assuming dumping to EEA south for full year)		**2,143,563**	**2,139,089**

Notes: OB = operations on overburden. CL = operations on coal. WE = wind erosion sources. UG = Activities associated with underground operations

The shaded rows show those activities related to the EEA and which have been switched on or off, depending on the dumping scenario.

The following conclusions have been made from examination of the data in **Table 6**:

- Adoption of the recommendations of the TRC and updates to the inventories for current estimates of material handling quantities leads to emissions which are in the order of 40% lower than those estimated in the Revised Project Report.
- BCC emissions with the proposed EEA modification are likely be lower than emissions with the approved EEA. This is due to slightly shorter haul routes and a smaller extent of disturbed areas.

The conclusions above indicate that the spatial extent of air quality impacts as presented in Revised Project Report were conservative. In addition, the proposed modifications will not increase off-site air quality impacts over those for the currently approved operation.

4.2 Potential Impacts on MCF

The CALPUFF computer-based air dispersion model has been used to predict PM_{10} concentrations due to the identified emission sources, and the model predictions have been compared with air quality criteria that have been established by the TRC.

Table 7 shows the model results as predicted maximum 24-hour average concentrations and predicted number of days above the assessment criteria (91 µg/m^3) at the MCF. **Figure 7** and **Figure 8** show time-series graphs of the predicted 24-hour average PM_{10} concentrations at the MCF for approved and proposed EEA scenarios, including background levels.

Table 7 Predicted PM_{10} concentration statistics for the MCF in Year 3

Scenario	Year 3 "Approved"	Year 3 "Proposed"
Predicted maximum 24-hour average* PM_{10} concentration, including background levels (µg/m^3)		
Dumping to EEA North / East	64	66
Dumping to EEA West	65	65
Dumping to EEA South	72	72
Predicted number of days* per year above 91 µg/m^3, including background levels		
Dumping to EEA North	0	0
Dumping to EEA West	0	0
Dumping to EEA South	0	0

** Bulga Coal Complex contribution is for a 13-hour period, between 6 am to 7 pm.*

Based on the model results from **Table 7**, **Figure 7** and **Figure 8**, it was concluded that the proposed modified EEA design will not change air quality conditions at the MCF, compared to the approved activities, and that the MCF assessment criteria can be met.

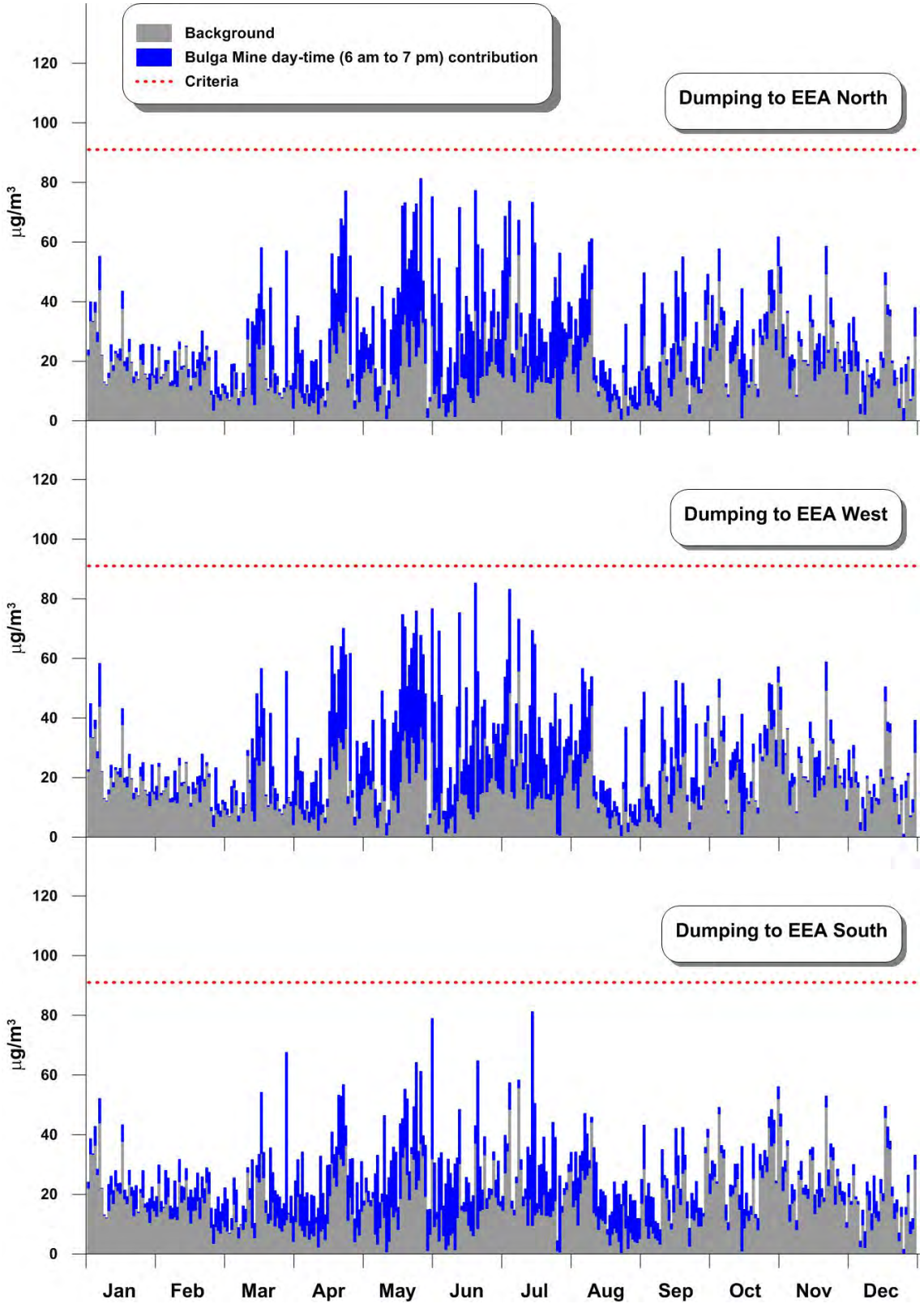

Figure 7 Predicted 24-hour average PM_{10} concentrations at the MCF in Year 3 for approved EEA

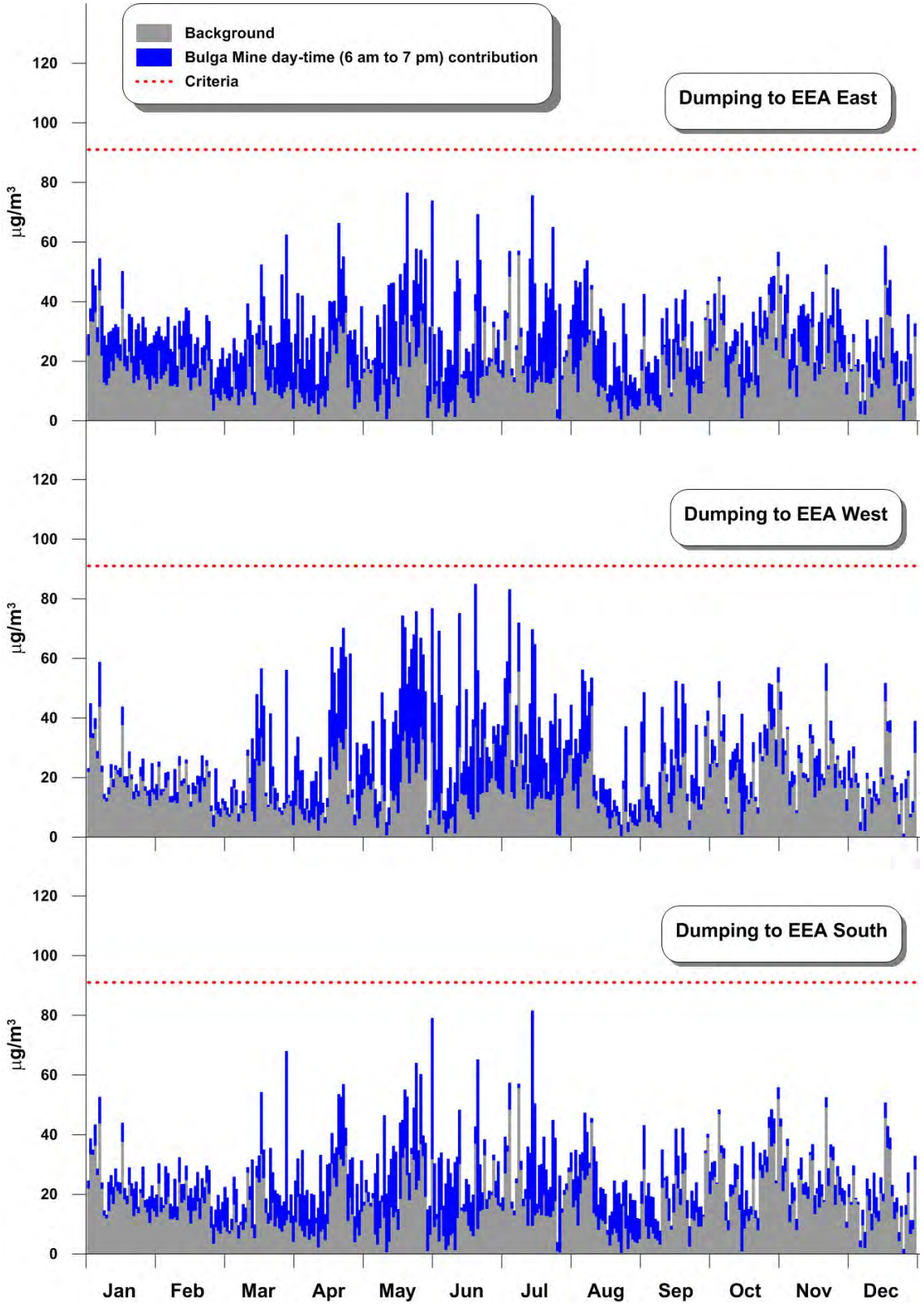

Figure 8 Predicted 24-hour average PM_{10} concentrations at the MCF in Year 3 for proposed EEA

4.3 Potential Impacts on Sensitive Receptors

Model predictions of PM_{10} concentrations at sensitive receptors to the north of the EEA are provided in **Table 8**. **Figure 1** shows the locations of the properties. The predictions have been compared to the Revised Project Report predictions (from PEL 2013) as well as the relevant assessment criteria. The model predictions for maximum 24-hour average PM_{10} concentrations, and days above 50 µg/m^3, are lower than the predictions from the Revised Project Report. This is as expected given the reductions in emissions that have been determined as part of the inventory update process for the TRC which addressed the relevant Development Consent conditions.

In contrast to the results for 24-hour averages, the annual average PM_{10} at the sensitive receptors are generally higher than the predictions from the Revised Project Report (primarily because of assumptions on background levels). The predictions with the EEA modification also show less variability than the predictions from the Revised Project Report, which is potentially more plausible given that the properties are only in the order of 400 metres apart. The predictions with the EEA modification range from 20 to 22 µg/m^3 and are consistent with the current (2014) monitored levels of around 22 µg/m^3. All predictions show compliance with EPA's 30 µg/m^3 criterion.

Therefore, based on the results from **Table 8**, it was concluded that the proposed modified EEA design will not change air quality conditions at the nearest private properties, compared to the approved activities, and that the PM_{10} assessment criteria can be met.

Table 8 Predicted PM_{10} concentration statistics for the private properties to the north of the EEA

Location	Prediction from the Revised and Amended Project Report (Year 4)	Prediction for Year 3 as proposed (with EEA modification)	Criteria
Predicted maximum 24-hour average PM_{10} concentration (Bulga Mine contribution only) (µg/m^3)			
1A	32	19	50 (Note, this is a cumulative criteria. It is provided for reference only, consistent with reporting in the Revised Project Report).
3	36	22	
8	30	25	
323	32	20	
324	27	19	
325	23	17	
Predicted number of days per year above 50 µg/m^3 (cumulative)			
1A	20	3	5 (NEPM)
3	17	3	
8	15*	4	
323	15	3	
324	15*	3	
325	15*	3	
Predicted annual average PM_{10} concentration (cumulative) (µg/m^3)			
1A	29	21	30
3	17	21	
8	17	22	
323	16	21	
324	15	20	
325	14	20	

** Estimated. Results not available for this location in the Revised and Amended Project Report.*

5. Conclusions

This report has provided an assessment of air quality impacts associated with a proposed change to the design of the Eastern Emplacement Area which was approved as part of the Bulga Optimisation Project. The assessment was carried out by quantifying the emissions from the BCC with the proposed EEA modification and comparing these to the estimated emissions from the BCC without the proposed EEA modification (that is, as approved). The two emission scenarios were then compared and the potential effect to off-site air quality was inferred.

The emission calculations made use of work recently completed since the Development Consent was issued. In addition, an air dispersion model was run to predict the potential change in air quality at the mushroom composting facility, located next to the proposed EEA, and at the nearest properties to the north of the EEA.

The assessment led to the following conclusions:

- The spatial extent of air quality impacts as presented in Revised Project Report is likely to be conservative (that is, an over-estimate of current estimates of the spatial extent of air quality impacts). This is because the current emission estimates for the approved BCC are in the order of 40% lower than those estimated in the Revised Project Report. The reduction is a result of adopting the recommendations of the TRC and updates to the inventories for current estimates of material handling quantities.
- BCC emissions with the proposed EEA modification are likely to be lower than emissions BCC Complex with the approved EEA. This is due largely to shorter haul distances, on average, and a smaller extent of disturbed areas. Therefore the proposed modifications will not increase off-site air quality impacts over those for the currently approved operation.
- Based on dispersion modelling, the proposed modified EEA design will not change air quality conditions at the MCF, compared to the approved activities, and the MCF assessment criteria can be achieved.
- Based on dispersion modelling, the proposed modified EEA design will not change air quality conditions at the nearest privately owned properties to the north of the EEA, compared to the approved activities, and relevant assessment criteria can be achieved.

6. References

DEC (2005) *"Approved Methods for the Modelling and Assessment of Air Pollutants in NSW"*. Published by the DEC (now EPA), August 2005.

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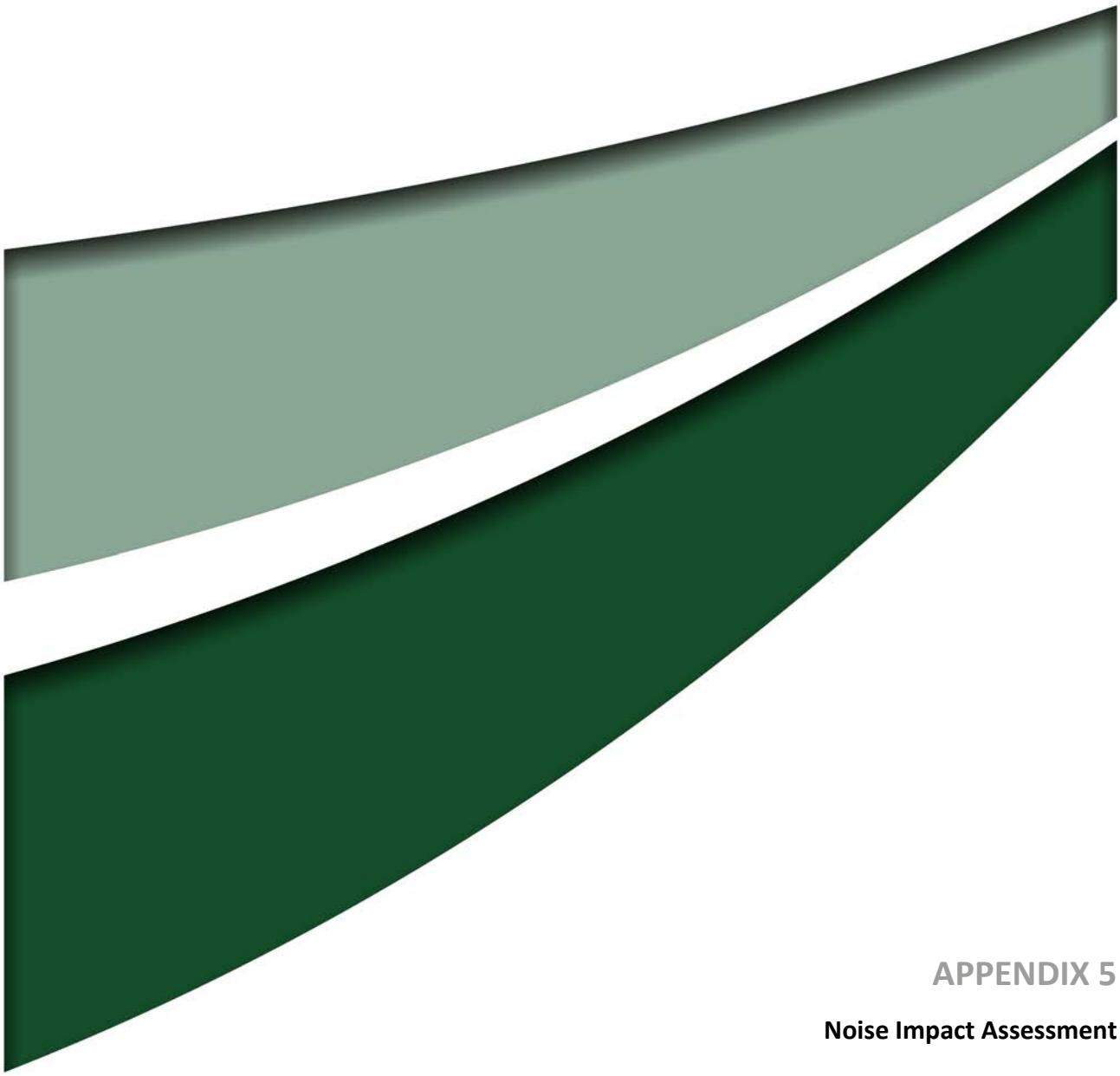

APPENDIX 5

Noise Impact Assessment

Global Acoustics
Noise and Vibration Analysis and Solutions

23 June 2016

Umwelt Australia
75 York Street
Teralba NSW 2284
Attention: Tim Browne

Dear Tim,

Regarding: Bulga Optimisation Project – Eastern Emplacement Area Development Consent Modification

1 INTRODUCTION

The Bulga Coal Complex (BCC) is an open cut and underground coal mining operation located approximately 12 kilometres west of Singleton in the Hunter Valley in NSW. Bulga Coal Management (BCM) operates the Bulga Surface Operations at the BCC on behalf of the Bulga Joint Venture. Approval for the Bulga Optimisation Project, which related to ongoing operation of the Bulga Surface Operations to 31 December 2035, was granted by the Planning Assessment Commission (under delegation from the Minister for Planning) on 1 December 2014 (BOP Consent). The underground operations at the BCC operate under a separate development consent (DA 376-8-2003) granted in 2004 (Bulga Underground Consent).

BCM proposes a change to the design of the Eastern Emplacement Area (EEA) approved as part of the Bulga Optimisation Project to a more efficient design, reducing the need for some currently approved infrastructure construction. A modification of the BOP Consent is sought under section 96(2) of the Environmental Planning and Assessment Act 1979 (EP&A Act) to obtain approval for the proposed modified development.

1.1 Background

The Environmental Impact Statement submitted for the Bulga Optimisation Project (Umwelt 2013a) (EIS) assessed the environmental impacts of the original Bulga Optimisation Project design which included an out-of-pit emplacement area located to the north of the BCC Infrastructure Area. This included part of an area of land owned by Mushroom Composters Pty Ltd (Mushroom Composters). This emplacement area was called the Eastern Emplacement Area or EEA. The Response to Submissions and Revised and Amended Project Application Assessment Report prepared for the Bulga Optimisation Project (Revised Project report) assessed an amended EEA design, which did not involve emplacement on the land owned by Mushroom Composters. This EEA design is approved under the BOP Consent.

Since granting of the BOP Consent, ongoing consultation with the Mushroom Composters has identified further opportunity to review the approved design for the EEA. A modification to the BOP consent is sought to obtain approval for the revised EEA.

Figure 1 shows the extent of the EEA included in the Revised Project. Figure 2 shows the indicative amended EEA extent, which forms the basis of the Modification. Figure 3 shows receptor locations.

This letter provides outcomes of a noise impact assessment (NIA) undertaken by Global Acoustics to determine any change in predicted noise impacts relative to the Revised Project.

1.2 Proposed Modification

The proposed modification relates only to the design of the EEA. Figure 2 shows the indicative design of the amended EEA, which is the subject of the proposed modification. The Stage 1 Composting Facility located on the Mushroom Composters land remains with the modified EEA design.

The table below shows the aspects of the existing approved development that will be impacted by the proposed modification.

Approved Development Component	Proposed Modified Development
Mining Areas	No change
Mining Methods	No change
Production Rates	No change
Open Cut MIA	No change
Eastern Emplacement Area	Design as shown in Figure 2
Noise and Visual Bund	No change
Underground Infrastructure	No change
Public Roads	No change
Tailings and Rejects Strategy	Additional tailings storage facility located within the confines of the existing mining operation, no change to the disturbance area.
External Coal Transport Infrastructure	No change
Electricity Infrastructure	No change*
Pipelines and Other Services Infrastructure	No change*

** The approved development includes the relocation of various infrastructure servicing the Stage 1 Mushroom Composting Facility. Some of this infrastructure may not require relocation as a result of the modification.*

1.3 Objectives

The primary objectives of this NIA are to determine if any changes in site noise emission are predicted relative to the approved Bulga Surface operations, and whether the BCC is predicted to maintain compliance with BOP Consent criteria. This NIA considers operational noise, low frequency noise, and potential sleep disturbance associated with the modification.

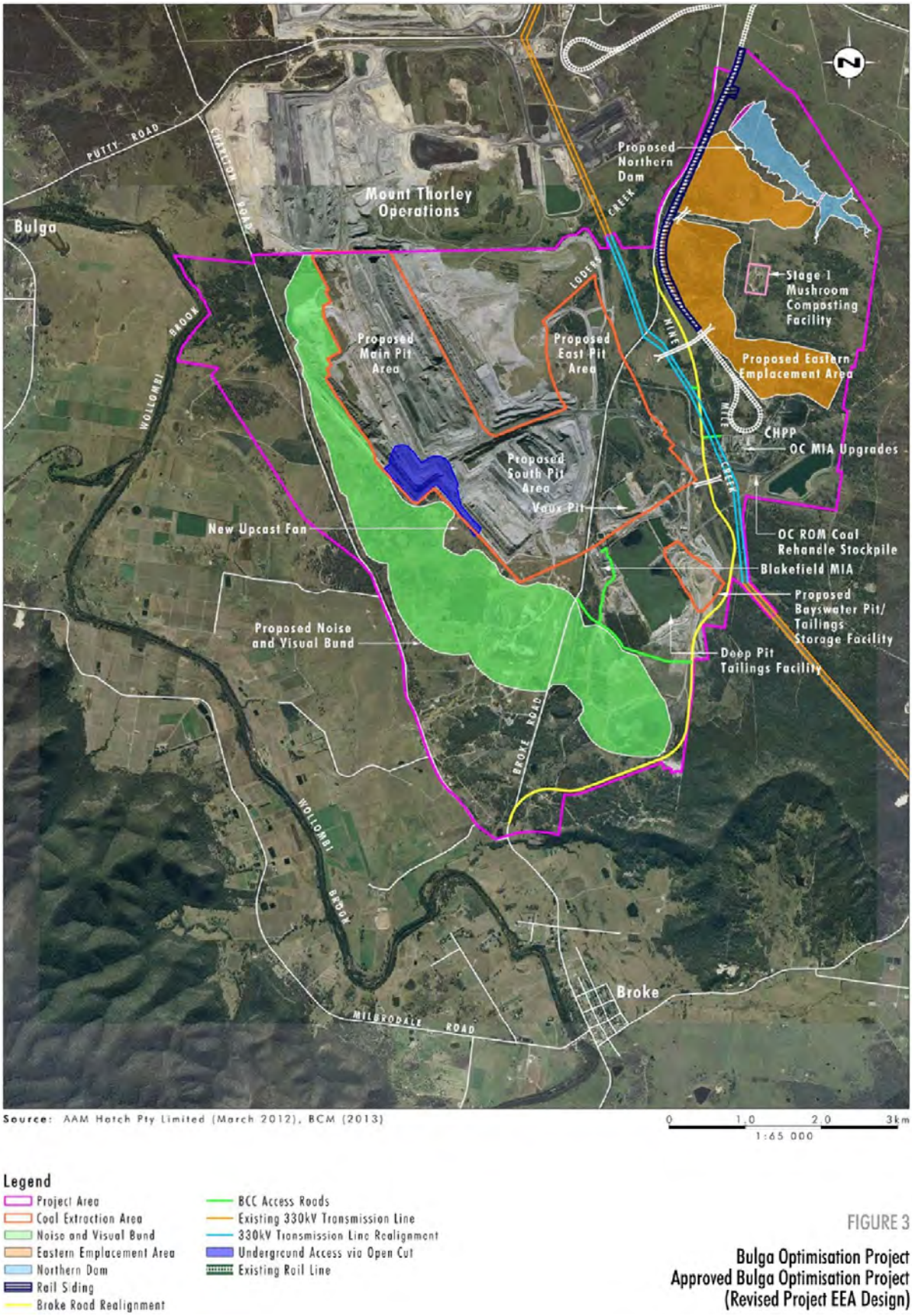

Figure 1: Approved Project EEA Extent

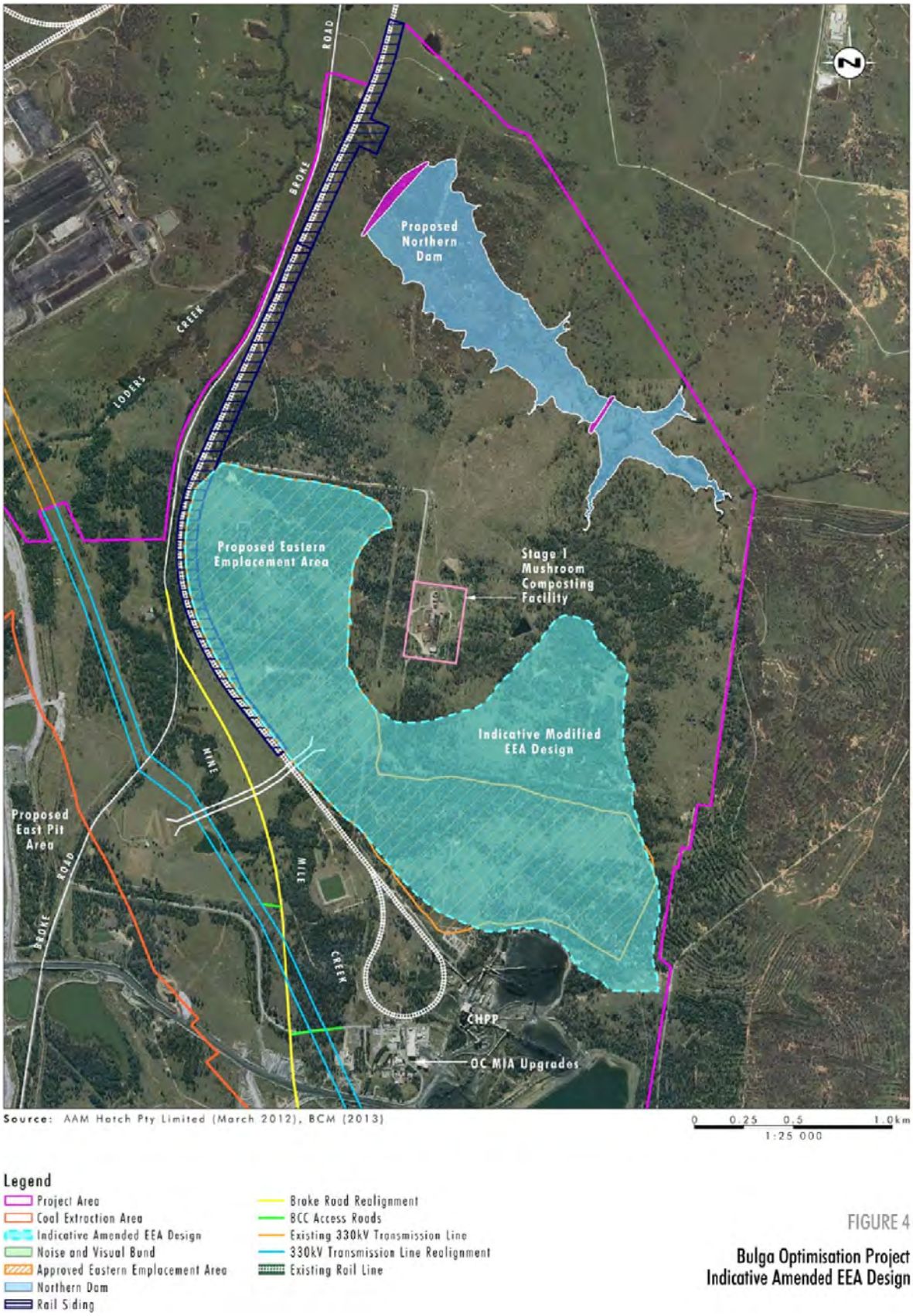

Figure 2: Amended EEA Extent (the modification)

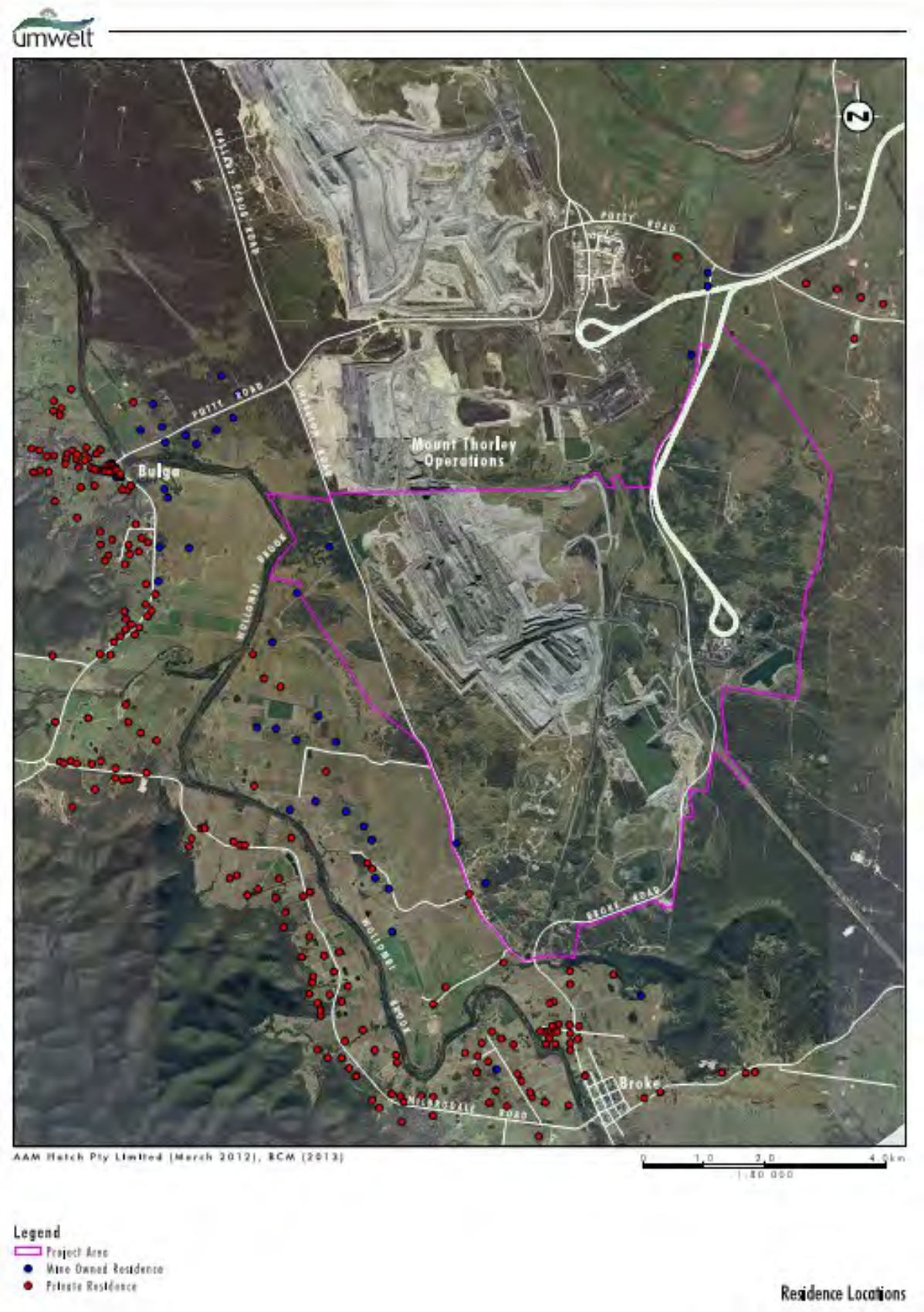

Figure 3: Receptor Locations

2 METHODOLOGY

For the EIS NIA and Revised Project, five staged operational noise scenarios were modelled representing the progression of mining operations over the proposed life of mine. Each stage modelled represented reasonable and feasible worst case operating conditions for each stage. The stages were referred to as Year 1, Year 4, Year 7, Year 13 and Year 19 (nominally years 2014, 2017, 2020, 2026 and 2032 for assessment purposes).

As Year 1 has now passed, Year 4, Year 7, Year 13 and Year 19 were included in this assessment.

Models developed for the Revised Project formed the basis of this assessment. All modelling methodology and parameters adopted for the Revised Project were retained. These include:

- Topography not directly affected by the modified EEA shape;
- Meteorological conditions and frequency distributions;
- Sound power of equipment;
- Equipment quantities;
- Operational noise controls, including bunds and barriers; and
- Management strategies.

Further detail regarding the operating scenarios is provided in Section 3.2.

2.1 Noise Modelling Assessment

Noise levels were predicted using RTA Technology's Environmental Noise Model (ENM), a computer based environmental noise model, to determine the acoustic impact of mining activities. The model takes into account geometric spreading, atmospheric absorption, and, barrier and ground attenuation. ENM Terrain Category 2, representing a rural land environment, was adopted for model input.

For consistency with previous assessments undertaken for the Bulga Optimisation Project, results were determined using the cumulative distribution of results methodology. Model predictions presented are 90th percentile levels for the worst case season.

2.2 Criteria

The BOP Development Consent was approved by the Minister for Planning in December 2014. Table 3 within Condition 3 of Schedule 3 of the BOP consent lists noise criteria applicable for residences on privately-owned land. This table is reproduced below.

Table 3: Noise Criteria dB(A)

Location	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$
1A, 8	38	38	38	45
97	38	38	36	45
217n, 230, 232, 234, 323, 324, 325	37	37	37	45
1B, 94, 95,103, 105A, 105C, 142A, 143B, 145, 164, 165, 179, 195, 217s, 217m, 222, 226, 227, 228, 229, 231, 233, 235, 237, 239, 240, 241, 261, 262, 263, 264, 265, 266, 272	36	36	36	45
All other privately-owned residences	35	35	35	45

Note: To interpret the land referred to in Table 3, see the applicable figure in Appendix 5.

Condition 4 of Schedule 3 of the BOP consent states that:

> *At the direction of the Secretary, Table 3 above shall be replaced with the Table in Appendix 6.*
>
> *Note: This direction will be given following the construction of the proposed noise and visual bund (see the figure in Appendix 2) to a height of 150 m AHD or the start of year 7 of the development under this consent, whichever occurs sooner.*

The table listing alternate noise criteria per Appendix 6 of the BOP consent is reproduced below.

Location	Day $L_{Aeq\ (15\ min)}$	Evening $L_{Aeq\ (15\ min)}$	Night $L_{Aeq\ (15\ min)}$	Night $L_{A1\ (1\ min)}$
95,142A, 143B, 164, 165, 195, 217s	36	36	36	45
All other privately-owned residences	35	35	35	45

The BOP is currently in the second year of operation since approval was granted, and is assessed against criteria listed in Table 3 of the BOP consent. Within this assessment, Year 4 model predictions are compared with criteria listed in Table 3 of the BOP consent. Year 7, Year 13 and Year 19 predictions are compared with criteria listed in Appendix 6 of the BOP consent.

2.3 INP Modifying Factors

Section 4 of the INP requires consideration of modifying factors. These are characteristics of noise received at receptor locations that could result in more annoyance than would normally occur from that level. The modifying factors are tonal noise, low frequency noise, impulsive noise, intermittent noise and duration (if single event).

Environmental noise monitoring undertaken around the BCC by Global Acoustics over the past 15 years has shown that these factors, other than low frequency noise, are rarely applicable.

For consistency with previous assessments undertaken for the Bulga Optimisation Project, evaluation of low frequency noise in this assessment is through both comparison of total predicted C-weighted levels at receptor locations with an upper limit criterion (Broner method), and, assessment of C-weighted minus A-weighted totals as per current INP guidelines (INP method).

2.4 Cumulative Noise Assessment

Detailed assessment of cumulative noise was not undertaken as part of this assessment. Operational noise predictions indicate minimal change in noise emission relative to the Revised Project. No change to cumulative noise levels is expected.

2.5 Road Traffic Noise

There is no change to road traffic volumes associated with the Modification; therefore, no change in road traffic noise impact relative to the Revised Project will occur.

3 NOISE MODEL PARAMETERS

3.1 Meteorology

For consistency with the Revised Project, modelled meteorological conditions and frequency distribution of meteorological conditions used for the Revised Project were retained.

Appendix D lists the 195 meteorological conditions included in the assessment.

3.2 Mining Scenarios

Four primary operating stages representing the various stages of development throughout the life of mine were modelled. The stages are referred to as Year 4, Year 7, Year 13 and Year 19. The Year 4 stage represents a worst case scenario with respect to construction of the EEA, and is the primary stage for which modified operations are assessed relative to the approved project. The main change for the latter stages is revised topography for the EEA landform, which could result in reduced or increased shielding for receptors located north-east of the BCC. The latter stages were included in this assessment to quantify any change in noise impact resulting from the modified EEA landform. The Year 7 stage also includes one relocated haul route and dozer relative to the approved project, as emplacement at the EEA would be complete by Year 7 for the modification.

Year 4, 7 and 13 stages were each divided into two secondary scenarios, representing day and evening/night operation. Plant quantities are generally the same for day and evening/night scenarios, however, overburden haulage and emplacement is modelled in more shielded locations in evening/night scenarios.

The four stages represent the following:

- Year 4 – The outer edges of the Noise and Visual Bund largely completed, development of the Eastern Emplacement Area (EEA) under-way. Worst case emplacement scenario for receptors nearby the EEA;
- Year 7 - Worst-case emplacement scenario for northern Main Pit area. Emplacement in EEA is complete. The dragline is still considered operational at this stage;
- Year 13 - Operations largely located in pit with final emplacement behind the Noise and Visual Bund, emplacement complete in EEA; and
- Year 19 - In-pit emplacement only, mining focused on the South Pit area. The Year 19 scenario is representative of operations through to Year 22 (life of mine).

Models developed for this assessment were based on models utilised for the Revised Project. The following sections outline model modifications relative to the previous assessment.

3.2.1 Year 4

Changes to the Year 4 model relative to the Revised Project include:

- Topographical contours forming the northern portion of the Revised Project EEA were removed and replaced with natural landform contours;
- Topographical contours forming the southern portion of the Revised Project EEA were removed and replaced with updated EEA landform contours;
- Three haul routes utilising the EEA were relocated to fit the updated EEA landform. Trucks utilising these haul routes were modelled emplacing overburden in an exposed location on top of the EEA at RL150; and
- Two dozers operating at the EEA tip head were relocated to fit the updated EEA landform. These were modelled in an exposed location on top of the EEA at RL150.

Appendix C, Figures C.1 and C.2 show modelled source locations and topography.

3.2.2 Year 7

Changes to the Year 7 model relative to the Revised Project include:

- Topographical contours forming the northern portion of the Revised Project EEA were removed and replaced with natural landform contours;
- Topographical contours forming the southern portion of the Revised Project EEA were removed and replaced with updated EEA landform contours;

- The Year 7 model for the Revised Project included emplacement in the EEA. For this assessment, emplacement in the EEA now complete. The haul route previously modelled in the EEA was relocated to the East Pit emplacement area; and

- Relocation of the dozer previously modelled at the EEA tip head to the East Pit emplacement area.

Appendix C, Figures C.3 and C.4 show modelled source locations and topography.

3.2.3 Year 13

Changes to the Year 13 model relative to the Revised Project include:

- Topographical contours forming the northern portion of the Revised Project EEA were removed and replaced with natural landform contours; and

- Topographical contours forming the southern portion of the Revised Project EEA were removed and replaced with updated EEA landform contours.

Appendix C, Figures C.5 and C.6 show modelled source locations and topography.

3.2.4 Year 19

Changes to the Year 19 model relative to the Revised Project include:

- Topographical contours forming the northern portion of the Revised Project EEA were removed and replaced with natural landform contours; and

- Topographical contours forming the southern portion of the Revised Project EEA were removed and replaced with updated EEA landform contours.

Appendix C, Figure C.7 shows modelled source locations and topography.

3.3 Model Assumptions

Model assumptions regarding equipment utilisation rates, mode of operation and Bulga Underground infrastructure remain unchanged from the Revised Project.

Table 3.1 to Table 3.3 list representative typical plant type and quantities included in each model stage. Plant types and numbers are representative of plant that are likely to be used for the Project; however, actual numbers and equipment type will vary to suit operational needs. Figures C.1 to C.7 in Appendix C show modelled plant locations, roadside noise bund locations, and pit shell topography.

Table 3.1: OPEN CUT PLANT ITEMS INCLUDED IN MODELS

Description	Plant Quantities			
	Year 4	Year 7	Year 13	Year 19
Hitachi EX2500 excavator	1	1	0	0
Hitachi EX3600 excavator	1	2	2	2
Hitachi EX5500 excavator	1	1	1	0
Hitachi EX5600 excavator	1	1	1	1
Hitachi EX8000 excavator	1	0	0	0
Hitachi EX8000 excavator replacement	0	1	1	1
P&H 4100XPC shovel	1	1	1	0
P&H 9020 dragline	1	1	0	0
Le Tourneau 1850 front end loader	1	1	1	1
Komatsu WA900 front end loader	1	1	1	1
CAT 834H rubber tyre dozer or similar	2	1	1	0
Caterpillar D11R dozer	8	9	8	5
Caterpillar D10T dozer	4	5	4	4
Caterpillar 789C XQ rear dump truck	11	11	9	14
Caterpillar 793D XQ rear dump truck	30	31	25	16
Caterpillar 797F XQ rear dump truck	8	8	8	0
Caterpillar 789C XQ water truck	3	3	3	2
Caterpillar 16H/16M grader	2	2	3	2
Caterpillar 24H/24M grader	2	2	1	0
Terex SKSw75 drill	3	3	3	2

Notes:

1. *Table shows representative typical plant to allow for assessment.*

Table 3.2: OPEN CUT PLANT ITEMS INCLUDED IN MODELS

Description	Plant Quantities			
	Year 4	Year 7	Year 13	Year 19
Goaf extraction units [1]	4	4	4	4
Flares with goaf extraction units [1,3]	0	0	0	0
Gas compressor with goaf extraction units [1,3]	0	0	0	0
Gas compressor at Whybrow Highwall location [2,3]	1	1	1	1
Flares at Whybrow Highwall location [2,3]	3	3	3	3
3 MW Power generators (at approved 25 MW power generation site)	3	3	3	3
Flares (at approved 25 MW power generation site)	4	4	4	4
4 MW Power generators (at proposed 32 MW power generation site)	8	8	8	8
Flares (at proposed 32 MW power generation site)	3	3	3	3
Underground ventilation fans (set of 3)	2	2	2	2
Underground drift conveyor (Blakefield South)	1	1	0	0
Underground drift conveyor drives (set of three)	1	1	0	0
Overland conveyor to CHPP (CV2206)	1	1	0	0
Overland conveyor drive (for CV2206)	1	1	0	0
Underground reclaim conveyor (Blakefield South stockpile to overland conveyor)	1	1	0	0
Sizing station at east end of underground reclaim conveyor	1	1	0	0
Reclaim conveyor drive	1	1	0	0
992 front end loader	0	1	1	1
Underground coal rear dump trucks	0	3	4	4
Goaf extraction units [1]	4	4	4	4

Notes:

1. *Goaf extraction units relocate to Whybrow Highwall from Broke Road location by Year 7;*
2. *Compressor and flares relocate to Whybrow Highwall location by Year 4; and*
3. *Compressor and flares do not operate simultaneously. Flares were modelled as worst case.*

Table 3.3: CHPP PLANT ITEMS INCLUDED IN MODELS (all stages)

Description	Quantity
Washery building	1
Stockpile dozers	3
Locomotives on rail loop (idle)	3
Reject bin	1
Rail load out bin	1
ROM conveyor	1
Reject conveyor	1
Overland to CHPP conveyor	1
CHPP clean coal conveyor	1
Skyline conveyors	2
Rail load out conveyor	1
Transfer stations	5

3.4 Noise Control Measures

Noise control measures incorporated into the assessment are the same as for the Revised Project. These are:

- A Noise and Visual Bund is to be constructed progressively around the western extent of the BCC to approximately RL150 metres AHD. Each modelled stage incorporates the extent of the bund as a barrier, as appropriate at that point in time;
- BCM operate a noise attenuated mobile fleet. Sound powers used in modelling were based on "in-service" attenuated levels that are achievable and maintainable;
- BCM will retain the hydraulic snubber on the dipper door (gate) of the shovel bucket to reduce impact noise often caused by the gate slamming shut, to minimise the potential for this source to cause sleep disturbance impact;
- Day and night scenarios were developed for some stages. Day scenarios consider overburden emplacement in more exposed areas, such as construction of the outer face of the noise and visual bund, and establishment of the Eastern Emplacement Area. Evening/night scenarios consider overburden emplacement in more shielded locations such as in pit, and behind dumps constructed during the day period where appropriate. BCM considers all scenarios to be reasonable and feasible in terms of achieving a viable mining operation;
- Five metre high roadside bunds were typically included to all haul roads above RL80, and to selected exposed haul roads below RL80;

- Ten metre high earth bunds were modelled on three sides of the ventilation fans at the relocated position on top of the Whybrow highwall from Year 7 onwards;
- The Hitachi EX8000 replacement excavator included a limiting sound power of L_W/L_{WA} 124/118 dB from Year 7 onwards. This excavator is to be used preferentially for operation close to the surface in South Pit when required; and
- Haul roads to out of pit emplacement areas such as the Noise and Visual Bund were strategically located to obtain beneficial topographical shielding from already constructed emplacement areas.

3.5 Plant Sound Power

Sound power data used in this assessment was the same as for the Revised Project. Table 3.4 lists sound power data used in the modelling assessment.

3.6 CHPP Sources

The amended EEA landform will provide a greater degree of topographical shielding between CHPP sources and receptors located north-east of site, as the emplacement area is closer to the CHPP than for the previous landform, the southern face is steeper, and the top is 5 metres higher along the source/receiver propagation path. Despite the obvious increase to the degree of shielding, the modelling software predicted slightly higher levels for some CHPP sources than previously predicted with a lower elevation EEA. Results from the previous model (previous landform) were applied to predictions for two CHPP stockpile dozers and three CHPP conveyor transfer stations to account for this difference for receptors 1A, 8, 323, 324 and 325. In Global Acoustics opinion, these sources would be inaudible at these locations due to the degree of shielding provided.

Table 3.4: SOUND POWER DATA

	Octave Band Sound Power Spectrum, L_{eq} dB								Total L_{eq} dB	
Description	**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**Lin**	**A wt**
Bulga Surface Operations Plant Sound Power (Open Cut)										
Hitachi EX3600 excavator	116	120	119	115	112	110	105	101	**124**	**118**
Hitachi EX2500 excavator	116	120	119	115	112	110	105	101	**124**	**118**
Hitachi EX5500 excavator	118	123	118	116	113	114	111	106	**127**	**120**
Hitachi EX5600 excavator	114	124	121	120	116	113	109	105	**128**	**122**
Hitachi EX8000 excavator	122	123	121	112	113	110	102	93	**127**	**118**
Hitachi EX8000 excavator replacement	114	119	118	116	113	110	105	101	**124**	**118**
P&H 4100XPC shovel	119	116	114	112	112	108	102	93	**123**	**116**
P&H 9020 dragline	120	119	116	117	112	111	102	92	**125**	**118**
LeTourneau 1850 front end loader	115	118	118	119	117	115	111	109	**125**	**122**
Komatsu WA900 front end loader	110	122	114	114	113	110	105	100	**124**	**118**
CAT 834H rubber tyre dozer	99	114	107	107	107	102	98	97	**116**	**111**
Caterpillar D11 dozer	110	114	113	112	112	105	98	92	**120**	**115**
Caterpillar D10 dozer	106	120	109	110	110	107	100	88	**121**	**114**
Caterpillar 789C XQ rear dump truck	112	117	114	112	109	107	101	96	**121**	**115**
Caterpillar 793D XQ rear dump truck	112	117	114	112	109	107	101	96	**121**	**115**
Caterpillar 797F XQ rear dump truck	120	119	117	114	111	108	103	105	**124**	**117**
Caterpillar 789C XQ water truck	112	117	114	112	109	107	101	96	**121**	**115**
Caterpillar 16H/16M grader	101	112	105	105	102	100	96	87	**114**	**108**

Description	Octave Band Sound Power Spectrum, L_{eq} dB								Total L_{eq} dB	
	63	125	250	500	1K	2K	4K	8K	Lin	A wt
Caterpillar 24H/24M grader	101	116	107	104	105	103	97	93	**117**	**110**
Terex SKSw75 drill	112	122	117	115	114	109	102	107	**125**	**118**
Bulga Underground Operations Plant Sound Power										
Gas flares (each)	110	103	101	99	92	94	95	97	**112**	**103**
Goaf extraction unit (each)	78	86	83	87	85	88	88	88	**95**	**94**
Underground drift conveyor (per 100m length), existing	103	105	100	98	92	90	84	78	**109**	**99**
Underground to surface conveyor (per 100m length), proposed	103	105	100	98	92	90	84	78	**109**	**99**
Underground drift conveyor drive (each)	109	108	111	107	102	100	93	87	**115**	**109**
Underground to surface conveyor transfer stations	114	115	115	113	112	107	100	91	**121**	**116**
Overland conveyor (per 100m length)	103	105	100	98	92	90	84	78	**109**	**99**
Overland conveyor drive	114	115	115	113	112	107	100	91	**121**	**116**
Underground reclaim conveyor (per 100m length)	103	105	100	98	92	90	84	78	**109**	**99**
Reclaim conveyor drive	109	108	111	107	102	100	93	87	**115**	**109**
Sizing station at east end of reclaim conveyor	112	112	110	111	113	111	107	102	**120**	**117**
Underground ventilation fans (per fan)	118	111	110	106	101	97	91	85	**119**	**108**
4 MW Power Generators (each)	82	90	87	91	89	92	92	92	**99**	**98**
3 MW Power Generators (each)	82	90	87	91	89	92	92	92	**99**	**98**
Gas compressors	99	99	107	97	91	91	90	79	**109**	**101**
Caterpillar 992 front end loader	106	111	109	108	111	106	99	93	**117**	**114**
Articulated rear dump trucks	106	121	113	112	110	110	99	99	**123**	**116**

Description	Octave Band Sound Power Spectrum, L_{eq} dB								Total L_{eq} dB	
	63	125	250	500	1K	2K	4K	8K	Lin	A wt
CHPP Plant Sound Power										
Locomotives on rail loop (3 x 90 class idle)	87	99	102	102	104	90	90	97	**109**	**106**
Reject bin	114	115	115	113	112	107	100	91	**121**	**116**
Rail load out bin	114	115	115	113	112	107	100	91	**121**	**116**
ROM conveyor (per 100m length)	103	105	100	101	97	93	85	79	**109**	**102**
Reject conveyor (per 100m length)	103	105	100	101	97	93	85	79	**109**	**102**
Overland to CHPP conveyor (per 100m length)	103	105	100	101	97	93	85	79	**109**	**102**
CHPP clean coal conveyor (per 100m length)	103	105	100	101	97	93	85	79	**109**	**102**
Skyline conveyor (per 100m length)	103	105	100	101	97	93	85	79	**109**	**102**
Rail load out conveyor (per 100m length)	103	105	100	101	97	93	85	79	**109**	**102**
Transfer stations	114	115	115	113	112	107	100	91	**121**	**116**
CHPP north façade	119	113	111	109	104	102	98	92	**121**	**111**
CHPP east façade	122	117	116	114	110	108	104	99	**125**	**116**
CHPP south façade	116	110	110	108	105	103	98	96	**119**	**111**
CHPP west façade	120	116	115	113	108	106	103	100	**123**	**115**

4 RESULTS

4.1 Operational Noise Results

Appendix A, Table A.1 contains predicted results for all private receptor locations included in the assessment. The following sections provide discussion of model predictions. Receptors located north-east of the BCC are discussed in more detail, as these have the greatest potential for change in noise impact due to the amended EEA design.

4.1.1 Year 4

Year 4 A-weighted model predictions indicate:

- Predicted change relative to the Revised Project is typically nil to +/- 1 dB.
- 47 receptors west of site have a predicted increase of 1 dB due to the modified operational layout, and adjustments to haul route locations. However, none of these receptors have predicted exceedance of BOP Consent criteria. A change of 1 dB is imperceptible to the human ear. Results for receptors with predicted change relative to the Revised Project are provided in Table 4.1.
- In terms of receptors north-east of site:
    - Receptor 1A – No change is predicted relative to the Revised Project.
    - Receptor 8 – A change of minus 1 dB is predicted for all time periods relative to the Revised Project.
    - Receptor 323 – A change of minus 1 dB is predicted for the evening period relative to the Revised Project. No change is predicted for the day and night periods.
    - Receptor 324 – No change is predicted relative to the Revised Project.
    - Receptor 325 – A change of plus 1 dB is predicted for the day period relative to the Revised Project. No change is predicted for the evening or night periods.

Year 4 predictions for all receptors are predicted to remain in compliance with BOP Consent criteria (Schedule 3, Condition 3, Table 3).

Table 4.1: YEAR 4 OPERATIONAL RESULTS, RECEPTORS WITH PREDICTED INCREASE, $L_{Aeq,15minute}$ dB

	BOP Consent Criteria			Preferred Project Result			BOP MOD 1 Result		
ID	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
20A	35	35	35	27	31	31	28	32	31
20B	35	35	35	27	31	31	28	32	31
23	35	35	35	21	29	28	21	29	29
33	35	35	35	20	29	27	20	30	28
37	35	35	35	19	22	20	19	23	21
38	35	35	35	24	29	28	24	30	29
60	35	35	35	30	34	33	30	34	34
62	35	35	35	31	34	33	31	34	34
63	35	35	35	30	34	33	30	34	34
71	35	35	35	31	34	34	31	35	34
86	35	35	35	29	32	31	29	32	32
87	35	35	35	29	32	31	29	33	32
91	35	35	35	28	30	29	28	30	30
94	36	36	36	32	35	34	32	35	35
95	36	36	36	32	35	34	32	35	35
98	35	35	35	30	33	32	30	33	33
101	35	35	35	31	35	33	31	35	34
108	35	35	35	28	31	31	29	32	31
113B	35	35	35	28	32	31	29	32	31
113A	35	35	35	28	32	31	29	32	31
116	35	35	35	29	31	30	29	31	31
117	35	35	35	28	30	30	29	31	30
121B	35	35	35	28	32	31	29	33	31
121A	35	35	35	28	33	31	29	33	31
126A	35	35	35	29	32	31	29	33	31

	BOP Consent Criteria			Preferred Project Result			BOP MOD 1 Result		
ID	Day	Evening	Night	Day	Evening	Night	Day	Evening	Night
126B	35	35	35	29	32	31	29	33	31
143A	35	35	35	31	32	30	31	32	31
149	NA [1]	NA [1]	NA [1]	35	38	37	36	38	37
153	35	35	35	26	32	30	27	32	31
154	35	35	35	32	32	31	32	33	31
156B	35	35	35	29	33	31	29	33	32
156w	35	35	35	30	34	32	31	34	32
160	35	35	35	32	34	34	32	35	34
169A	35	35	35	31	33	31	31	33	32
170	35	35	35	31	33	31	31	33	32
177A	35	35	35	30	32	31	31	32	31
183	35	35	35	32	33	32	32	33	33
185	35	35	35	31	33	32	32	33	32
206	35	35	35	24	26	25	25	26	25
217s	36	36	36	32	33	32	32	33	33
217m	36	36	36	30	32	32	30	33	32
222	36	36	36	30	34	33	31	34	33
256	35	35	35	30	34	34	31	34	34
300	35	35	35	23	25	25	25	27	27
302	35	35	35	26	28	28	27	28	28
319B	35	35	35	32	34	33	32	34	34

Notes:

1. *Criteria are NA as property has acquisition rights in accordance with the BOP Consent.*

4.1.2 Year 7

Year 7 A-weighted model predictions indicate:

- No increase relative to the Preferred Project is predicted for any receptors located west of site.
- In terms of receptors north-east of site:
    - Receptor 1A – No change is predicted relative to the Revised Project.
    - Receptor 8 – A change of minus 1 to 2 dB is predicted relative to the Revised Project.
    - Receptor 323 – No change is predicted relative to the Revised Project.
    - Receptor 324 – A change of minus 1 dB is predicted relative to the Revised Project for all time periods.
    - Receptor 325 – A change of minus 1 dB is predicted relative to the Revised Project for the night period. No change is predicted for the day or evening periods.

Year 7 predictions for all receptors are predicted to remain in compliance with BOP Consent criteria (Appendix 6 of the BOP Consent).

4.1.3 Year 13

Year 13 A-weighted results indicate:

- No increase relative to the Revised Project is predicted for any receptors located west of site.
- In terms of receptors north-east of site:
    - Receptor 1A – An increase of 1 dB is predicted relative to the Revised Project for the evening and night periods. No change is predicted for the day period.
    - Receptor 8 – A decrease of 1 dB is predicted relative to the Revised Project for all time periods.
    - Receptor 323 – An increase of 1 dB is predicted relative to the Revised Project for all time periods.
    - Receptor 324 – No change is predicted relative to the Revised Project.
    - Receptor 325 – An increase of 2 dB for the day period, and 1 dB for the evening and night periods is predicted relative to the Revised Project.

Year 13 predictions for all receptors are predicted to remain in compliance with BOP Consent criteria (Appendix 6).

4.1.4 Year 19

Year 19 A-weighted results indicate:

- No increase relative to the Revised Project is predicted for any receptors located west of site.
- In terms of receptors north-east of site:
    - Receptor 1A – An increase of 1 dB is predicted relative to the Revised Project for all time periods.
    - Receptor 8 – A decrease of 1 dB is predicted relative to the Revised Project for all time periods.
    - Receptor 323 – An increase of 1 dB is predicted relative to the Revised Project for the day and evening periods. No change is predicted for the night period.
    - Receptor 324 – A decrease of 1 dB is predicted relative to the Revised Project for the evening period. No change is predicted for the day or night periods.
    - Receptor 325 – An increase of 3 dB is predicted relative to the Revised Project for the day period. An increase of 2 dB is predicted for the evening and night periods.

Year 19 predictions for all receptors are predicted to remain in compliance with BOP Consent criteria (Appendix 6).

4.2 Low Frequency Noise Assessment Results

4.2.1 Broner Method Results

C-weighted predictions for all modelled receptors are included in, Appendix B, Table B.1.

All total C-weighted predictions, with the exception of receptor 149 which has acquisition rights with BCM, are less than or equal to $L_{Ceq,15minute}$ 50 dB, which is 10 dB or more below the desirable low frequency noise (LFN) limit of $L_{Ceq,15minute}$ 60 dB. This outcome is consistent with outcomes of the Revised Project.

Based on the results of the Broner method assessment, LFN is not considered likely to cause impact.

4.2.2 INP Method Results

C minus A predictions for all receptors are included in Appendix B, Table B.2.

Table 4.2 indicates the count of receptors with A-weighted predictions within 5 dB of the relevant BOP Consent criterion, and, C minus A result greater than or equal to 15 dB by stage and time period. The number of discreet receptors within each stage is also indicated, along with change relative to the Revised Project. Receptors with A-weighted predictions more than 5 dB below the relevant BOP Consent criterion are not included, as application of a LFN modifying factor penalty would not cause criterion exceedance, and both A-weighted and C-weighted predictions are low level in these cases. Using a strict application of

the NSW Industrial Noise Policy (INP), these properties would attract a 5dB penalty to be added to predicted $L_{Aeq,15minute}$ noise levels.

Table 4.2: OPERATIONAL C MINUS A LFN RESULTS

	Count of receptors within 5 dB of criterion, AND C-A >= 15 dB			
Stage	**Day**	**Evening**	**Night**	**Discreet**
Year 4	17 (-5)	17 (-4)	36 (-2)	52 (-10)
Year 7	34 (4)	43 (-1)	54 (3)	79 (1)
Year 13	10 (0)	37 (0)	40 (0)	51 (0)
Year 19	0 (0)	6 (0)	4 (-1)	6 (0)

Notes:

1. *Results in brackets indicate change relative to the Revised Project.*

4.2.3 Conclusion

The Revised Project NIA provided discussion regarding inadequacies of the INP method. An alternate approach is included in the draft Industrial Noise Guideline (dING), which will likely replace the current INP method. However, the dING approach is not yet policy; therefore, in the interim, low frequency noise is assessed against Broner criteria for consistency with previous BOP assessments.

All C-weighted predictions, with the exception of Receptor 149, which has acquisition rights with BCM, are less than or equal to $L_{Ceq,15minute}$ 50 dB. This is considerably less than the preferred Broner criterion (in acoustic terms, only one tenth of). LFN penalties have therefore not been applied.

4.3 Sleep Disturbance

Operational noise predictions indicate minimal change in noise emission relative to the Revised Project. No change to maximum noise level emission relative to the Revised Project is expected.

5 NOISE MITIGATION STRATEGIES

5.1 Operational Controls and Management Strategies

Operational controls and mitigation strategies incorporated into this assessment are identical as those included in the Revised Project assessment. These are listed below.

Operational Controls

- Development of a noise and visual bund on the western extent of the site to provide shielding to receptors west and south west of the site;
- Place and shape overburden on the exposed outer surface of the noise and visual bund only during day shift (7am to 7pm);
- Implement overburden emplacement strategies to meet relevant noise criteria. This may include measures such as provision of shielded tipping locations for night time dumping and different day time and night time dumping scenarios;
- Construct haul road bund, where safe and practicable to do so, to a height of approximately 5 m above road level for all haul roads above RL80m, and to selected exposed haul roads below RL80m, to reduce noise emanating to the west of the operations;
- Retention of the hydraulic snubber on the face shovel so this noise source will not be a cause of sleep disturbance;
- Construct ten metre high earth bunds to prevent line of sight from the ventilation fans to receptors west of the site when relocated to the top of the Whybrow highwall;
- Specify a limiting sound power in tender documents for the Hitachi EX8000 replacement excavator of L_W 124 dB;
- Operation of the quietest suitable equipment in sensitive areas such as excavation close to the surface during adverse meteorological conditions; and
- Construct haul roads to out of pit emplacement areas such as the Noise and Visual Bund strategically to obtain beneficial topographical shielding from already constructed emplacement areas.

Management Strategies

- Continuation of regular sound power screening testing that will assist in managing equipment sound power levels, and identify plant items requiring maintenance to noise attenuation packages;

- Continuous noise monitoring will be continued at strategic off site locations to provide real time feedback to the mine for noise management. Current locations and trigger levels are outlined in the Bulga Coal Complex Noise Management Plan (BCM, 2015);

- Monitoring of real time meteorological conditions and forecasts to assist in noise management;

- Development of a complaints investigation protocol with Mount Thorley Warkworth mine to address noise complaints from the Bulga Village area, in consultation with MTW; and

- Offering reasonable and feasible noise mitigation measures such as double glazing, insulation and/or air conditioning will be made available to affected landowners upon request, as outlined in the BOP Consent.

BCM operate Best Available Technology Economically Achievable (BATEA) plant, utilise acoustic bunds on exposed haul roads, and implement day and night operating scenarios to manage noise emissions from the site. These elements, and the control options and management strategies detailed above have been incorporated into the modelling assessment. In Global Acoustics' opinion, all reasonable and feasible noise mitigation measures have been applied to the assessment.

6 SUMMARY

BCM proposes a change to the design of the Eastern Emplacement Area (EEA) approved as part of the Bulga Optimisation Project to a more efficient design. A noise impact assessment was undertaken to determine if any changes in site noise emission are predicted relative to the Revised Project, and whether the BCC is predicted to maintain compliance with BOP Consent criteria.

Receptors located north-east of site have the greatest potential for change in noise impact due to the amended EEA design, as the EEA is located generally between the site and these residences. Omitting the northern portion of the previously approved EEA landform has potential to reduce topographical shielding provided by the EEA in this direction.

Model predictions indicate changes in site noise emissions are insignificant for all assessed stages of operation, for all receptors. Compliance with BOP Consent criteria is predicted for all stages.

Low frequency noise predictions were more than 10 dB below the adopted criterion of $L_{Ceq,15minute}$ 60 dB, as per Broner. Accordingly, no LFN modifying factor penalties were applied.

In summary, the zone of affectation is predicted to remain unchanged relative to that determined for the Revised Project. Predicted change in noise levels relative to the approved project is insignificant, and would be imperceptible to the human ear.

Regards,

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Civil Engineer (Acoustics)

Global Acoustics Pty Ltd

7 REFERENCES

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APPENDIX

A A-WEIGHTED OPERATIONAL NOISE RESULTS

Table A.1: A-WEIGHTED OPERATIONAL NOISE LEVELS, $L_{Aeq,15minute}$ dB

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
1A	Hedley	36	38	38	33	35	35	29	33	33	28	31	31
1B	Cant	31	35	34	33	35	35	31	34	34	27	30	30
8	Marland	35	37	37	30	33	33	26	30	31	24	29	30
20A	Bosco	28	32	31	28	31	31	27	31	31	25	29	29
20B	Bosco	28	32	31	28	31	31	27	31	31	25	29	29
21	Rogers	27	31	31	27	31	31	25	31	30	23	29	29
23	Hungerford	21	29	29	20	28	28	19	27	26	13	26	26
33	Stevens and Company Pty Limited	20	30	28	21	29	27	19	25	20	17	23	22
37	Earl	19	23	21	19	22	20	19	21	20	17	20	19
38	Parkes	24	30	29	25	30	28	21	30	27	19	30	26
41	Darcy Byron Pty Ltd	31	34	34	30	33	33	28	31	30	25	31	30
46	Gleave	31	34	34	30	33	32	28	31	30	26	30	30
55	Crow	31	34	34	30	34	33	28	32	32	27	31	31
56	Lambkin	31	34	34	30	33	33	28	32	32	26	31	30
57	Rogers	31	34	34	30	33	33	29	32	32	26	31	30
58	Stafa	31	34	34	30	33	33	28	32	32	27	31	30

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
60	Poile	30	34	34	30	33	33	28	32	31	27	31	30
61	Larkin	31	34	34	30	33	33	29	32	32	26	31	30
62	Sanger	31	34	34	30	33	33	28	32	32	26	31	30
63	O'Toole	30	34	34	30	33	33	28	31	31	26	30	30
71	Garth	31	35	34	30	34	33	29	33	33	26	31	30
72	Matley	30	34	34	30	33	33	28	32	32	27	31	30
73	Hebbe and Bush	30	34	34	30	33	33	28	32	32	27	31	30
74	Towers and Maviglia	30	34	34	30	33	33	28	32	32	27	31	30
76	Chaffey	30	34	34	30	33	33	28	32	32	27	31	30
78	Smolenaers	30	34	34	30	33	33	28	32	32	27	31	30
80	Duggan	30	33	33	29	32	32	28	31	30	26	30	29
82	Mears	30	33	33	29	32	32	28	31	30	26	29	29
83	NightingaleVineyards PTY Limited	30	33	33	29	33	33	29	31	31	26	30	29
84	Stacey	30	33	33	30	34	33	29	32	31	27	30	30
85	Towns	30	33	33	30	34	33	29	32	31	27	30	30
86	Richardson	29	32	32	30	34	33	29	33	32	27	31	30
87	Connolly	29	33	32	30	34	33	28	34	32	27	31	30
88	Ferguson	31	35	34	31	35	34	29	35	33	27	32	31

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
90	Tsiolkas	29	32	31	30	33	32	29	33	32	26	30	29
91	Dunn and Wakeman	28	30	30	29	32	31	29	32	31	26	29	28
93	Danks	31	34	34	32	35	34	30	34	33	27	31	30
94	Rozene Pty Limited	32	35	35	32	35	34	30	35	34	28	32	31
95	Rozene Pty Limited	32	35	35	32	36	35	30	35	34	28	32	31
97	Lambkin	31	34	33	31	34	33	33	32	31	29	32	31
98	Fromberg	30	33	33	31	34	33	29	33	32	26	30	29
100	Calcott-McKenzie	28	31	31	27	30	29	24	27	26	21	26	25
101	Boustred Spence Turner and Cowan	31	35	34	31	35	33	30	34	33	27	31	30
102	Morsillo	31	35	34	32	35	34	30	34	33	27	31	30
103	Bell	32	35	34	32	35	34	30	34	33	28	32	31
105A	Bird and T Lambkin	31	34	33	32	35	33	32	35	33	29	32	31
105B	Bird and T Lambkin	30	32	31	31	34	32	31	34	33	28	31	30
105C	Bird and T Lambkin	31	34	33	32	35	33	32	35	33	29	32	31
108	Cowan	29	32	31	30	33	32	29	33	32	26	30	29
109	Romke	29	32	31	30	33	32	28	32	32	26	29	29
113B	Cowan	29	32	31	30	32	31	28	32	31	25	29	28
113A	Cowan	29	32	31	30	32	31	28	33	31	26	29	28

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
114	Palmer	29	32	31	30	32	31	28	32	31	25	29	28
115	Goldfinch	29	32	31	30	33	31	28	32	31	25	29	28
116	Houtzaager	29	31	31	30	32	31	28	32	31	26	29	28
117	Tolson	29	31	30	29	31	30	29	32	31	26	29	28
118	McManus	28	30	29	28	31	30	29	31	30	26	28	27
119	Hann-Devries	28	31	30	29	32	31	27	30	30	25	29	28
121B	Hope	29	33	31	31	34	32	29	32	31	26	30	29
121A	Hope	29	33	31	30	33	31	28	32	30	26	30	29
122	Warr	29	32	31	30	33	32	29	32	31	25	29	28
123	Jackson and Edwards	29	32	31	31	33	32	30	33	32	26	30	29
124	Kearns and McKell	29	32	31	31	33	32	30	33	32	26	30	29
125	Little	29	33	31	31	34	32	30	33	32	27	30	29
126A	Coranton Pty Limited	29	33	31	31	33	32	30	33	32	26	29	28
126B	Coranton Pty Limited	29	33	31	31	34	32	30	33	32	26	29	28
130	Wood	30	33	31	32	34	32	31	34	33	27	30	29
131	Gittoes	30	33	31	32	34	32	31	34	33	27	30	29
132	McLaughlin	30	34	31	32	34	33	31	35	33	27	31	30
137	George	30	33	31	32	34	33	31	35	33	28	31	30

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
138	Re	30	33	31	33	34	33	31	35	34	28	31	30
139	Logan	30	34	32	32	34	33	31	35	34	27	31	30
140	Logan	31	34	32	32	34	33	31	35	33	27	31	30
142A	Ewen	30	32	31	32	34	32	30	36	33	27	31	29
142B	Ewen	31	34	32	33	35	33	31	35	33	27	31	29
142C	Ewen	31	34	32	33	35	33	31	35	33	27	31	29
143A	Lawson	31	32	31	31	33	31	30	35	33	27	30	29
143B	Lawson	31	34	32	33	35	33	31	36	34	28	32	30
144	Bevan	30	32	30	31	34	32	30	35	32	27	30	29
145	Elsmore	31	32	31	32	33	32	30	34	32	27	31	29
149	McInerney	36	38	37	36	39	38	34	38	36	32	36	34
156B	Todhunter and Brook	29	33	32	30	34	33	27	32	31	24	30	29
156w	Todhunter and Brook	31	34	32	31	34	33	28	32	31	25	30	29
162	Lamaro	32	33	31	31	34	32	29	34	32	27	30	30
164	Sharrock	31	33	31	32	34	33	32	36	35	28	31	30
165	Garton	31	35	33	33	36	33	32	36	35	28	32	31
169A	McCraw	31	33	32	32	34	32	30	34	33	27	30	29
169e	McCraw	32	33	31	31	34	33	29	34	32	27	30	29

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
170	Owens	31	33	32	32	33	32	30	34	33	27	31	29
171	Owens	32	33	32	32	34	33	30	34	33	27	30	29
174	Kastelic	30	33	31	32	33	32	32	35	34	27	31	29
175	Grapemen Holdings Pty Limited	31	33	32	31	33	32	30	35	34	27	31	30
176	Grapemen Holdings Pty Limited	31	33	32	31	34	33	31	35	34	27	31	30
177B	Tulloch	30	32	31	32	34	33	31	34	34	26	30	30
177A	Tulloch	31	32	31	32	33	32	30	34	33	26	30	30
179	Brooks and Thompson	33	34	33	31	35	34	31	34	33	28	31	30
183	Foster	32	33	33	32	34	33	31	35	34	27	31	30
184	Esslemont Family Holdings PTY Limited	32	33	33	32	34	34	30	35	34	27	31	30
185	Poulos	32	33	32	32	34	33	30	34	34	27	31	30
188C	Tulloch	31	32	32	32	34	32	30	34	33	26	31	30
188A	Tulloch	31	32	32	32	33	32	30	34	33	26	31	30
188B	Tulloch	31	32	32	32	34	32	30	34	33	26	31	30
190	Gallagher	29	32	32	30	33	32	29	33	32	25	29	28
191	Robards and Myers	29	33	32	30	34	33	29	33	32	25	29	28
192	Carr	29	33	32	30	33	33	29	32	32	25	29	28
193	Britten and Herlihy	29	32	32	30	33	32	29	32	31	25	28	28

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
194	Smith	11	12	11	11	11	11	10	10	10	10	10	10
195	Kennedy	32	34	33	32	34	34	30	36	34	25	30	29
197	Kennedy	33	33	32	31	34	33	32	35	34	26	31	30
198	Orton	30	33	31	31	34	33	30	34	33	26	30	30
199	Gould	30	33	32	31	34	33	30	33	33	25	30	29
200	Benchoam	29	33	31	31	34	33	30	33	33	26	30	29
202	Lakayev	29	33	32	29	33	32	29	31	31	24	28	27
203	Schipper	29	33	32	30	33	32	29	32	32	26	29	28
204	Leonard	24	26	25	24	26	25	24	27	26	16	20	19
206	Helliker	25	26	25	24	25	25	24	27	27	17	21	20
207	Carr Thompson and Shearim	24	26	25	24	25	25	24	28	27	17	21	20
208	Leslie	25	26	25	24	25	25	24	27	27	17	21	20
209	Leslie	25	26	25	24	25	25	25	27	27	17	21	20
211	Brennan	29	33	31	31	34	33	30	33	33	26	29	29
212	Icelink PTY Limited	29	33	32	31	34	33	30	33	33	27	29	29
213	Icelink PTY Limited	28	33	31	30	33	32	30	32	32	26	28	28
214	Sydney Gas Operations PTY Ltd	28	32	31	29	32	31	29	31	31	26	28	27
217s	Russell	32	33	33	32	33	33	32	36	36	26	32	31

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
217m	Russell	30	33	32	30	33	33	32	35	35	26	32	32
217n	Russell	31	31	31	33	32	32	28	35	34	22	30	29
220	Purser and Keayes	30	34	33	31	33	33	31	33	33	26	29	29
221	Brasington	30	34	33	31	33	33	30	33	33	27	29	29
222	Vassallo	31	34	33	32	34	34	31	34	34	26	30	30
223	Jackson	30	34	34	32	34	33	31	33	33	27	30	29
225	Harris	30	32	32	30	32	32	29	31	31	26	28	28
226	Vassallo	31	34	34	32	34	34	31	34	34	26	30	30
227	Beavis	31	34	34	32	34	34	31	34	34	26	30	29
228	Lamb	31	34	34	33	34	34	31	34	34	26	30	30
229	Ritchie	31	34	34	33	34	34	31	34	34	27	30	29
230	Cant	32	35	35	34	35	35	32	35	34	27	30	30
231	Dawson	32	35	35	33	34	34	31	34	34	27	30	30
232	Medhurst	32	36	36	34	35	35	32	35	35	28	32	32
233	Vikas	32	35	35	34	35	35	32	35	34	27	31	31
234	Thompson	32	36	35	33	34	34	31	35	34	27	31	31
235	Caban	32	35	35	33	34	34	30	34	34	27	30	30
236	Krey	31	34	34	32	33	33	30	33	33	27	30	30

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
237	Ryan and Harrison	32	36	36	33	34	34	31	34	34	28	31	31
238	Topham	32	35	35	32	33	33	30	33	33	27	30	30
239	Waters	30	33	33	31	32	31	30	33	33	24	27	27
240	Godyn	31	36	36	33	34	34	31	34	34	28	31	31
241	Kaizer	31	35	35	32	33	33	30	33	33	27	30	30
242	Bridge	31	35	35	32	33	33	30	33	33	27	30	30
243	Neville	31	35	35	32	33	33	30	33	33	27	30	30
244	Caban	30	34	34	31	32	32	29	32	32	27	29	29
247	Upward	30	33	33	30	32	32	29	31	31	26	28	28
250	Icelink PTY Limited	30	34	33	31	33	33	31	33	33	27	29	29
254	Mitchell	31	35	35	31	33	33	30	32	32	27	29	29
256	Cameron	31	34	34	31	33	33	30	32	32	27	28	28
261	Smith	32	36	36	33	34	34	31	34	34	27	30	30
262	Smith	32	36	36	33	34	34	31	33	33	27	30	30
263	Reid	32	36	36	32	34	34	31	33	33	27	30	30
264	Reid	32	36	36	33	34	34	31	33	33	27	30	30
265	Turnbull	32	36	36	32	34	34	31	33	33	27	29	29
266	Hedley and Louis	32	36	36	32	34	34	31	33	33	27	29	29

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
272	Bulga Community Centre Incorporated	32	36	36	32	34	34	31	33	33	27	29	29
273	Silk	32	35	35	32	34	34	31	33	33	27	29	29
275	Dragicevic	32	35	35	32	34	34	31	33	33	27	29	29
276	Cooke	32	35	35	32	34	34	31	33	33	26	29	29
279	Bendall	32	35	35	32	34	34	31	33	33	27	29	29
280	Magin	32	35	35	32	34	34	31	33	33	27	29	29
281	Harris and Ferguson	32	35	35	32	34	34	31	33	33	27	29	29
283	Saunders	32	35	35	32	33	33	30	33	33	26	29	29
285	Harris	32	35	35	32	33	33	30	32	32	26	29	29
286	McLachlan	32	35	35	32	33	33	30	32	32	26	29	29
287	McLaughlin	32	35	35	31	33	33	30	32	32	26	29	29
288	Ford	32	35	35	32	33	33	30	33	33	26	29	29
289	Pringle	31	34	34	31	33	33	30	32	32	26	28	28
290	Janse van Rensburg	31	34	34	31	33	33	30	32	32	26	28	28
291	Adamthwaite	31	34	34	31	33	33	30	32	32	26	28	28
292	Evans	31	34	34	32	33	33	30	32	32	26	28	28
293	Gallagher	31	34	34	31	33	33	30	32	32	26	28	28
294	Brown	31	34	34	31	33	33	30	32	32	26	28	28

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
295	Carnevale Testa Angelatos	31	34	34	31	32	32	30	32	32	26	28	28
296	Burgess	31	34	34	31	32	32	30	31	31	26	28	28
297	Fogwell	31	34	34	31	32	32	30	31	31	26	28	28
298	Player	28	30	30	28	29	29	24	26	26	21	23	23
300	Price	25	27	27	23	25	25	23	26	26	18	21	21
301	Powell and Shannon	22	24	24	23	25	25	22	25	25	18	21	21
302	Harrison	27	28	28	25	26	26	23	26	26	19	22	22
303	McKenzie	28	29	29	29	30	30	28	30	30	23	25	25
304	Banks	30	32	32	30	31	31	29	30	30	25	27	27
305	Anderson	30	32	32	30	31	31	29	30	30	25	27	27
306	Gregory	31	34	34	32	33	33	30	32	32	26	28	28
309	Louis	30	33	33	30	32	32	29	31	31	25	27	27
311	Mulally McMaugh Burke	31	35	35	31	34	34	29	33	32	24	30	30
314	Hanson	30	32	32	30	32	32	29	31	31	25	27	27
316B	Caban	30	33	33	30	32	32	29	31	31	25	27	27
316A	Caban	30	32	32	30	31	31	28	30	30	25	27	27
317	Lancaster	30	33	33	30	32	32	29	31	31	24	28	28
319B	Estvale Holdings Pty Ltd	32	34	34	31	33	33	28	32	32	25	31	30

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
319A	Estvale Holdings Pty Ltd	32	34	34	31	34	33	28	32	32	25	32	30
323	Poulsen	35	36	37	33	35	35	31	32	33	30	32	32
324	Wood	33	35	36	29	31	32	25	28	29	23	26	28
325	Ancich	35	36	37	31	34	34	30	32	33	28	31	32
326	McNaught	21	24	24	22	23	23	21	24	24	16	19	19

Notes:

1. *Receptor 149 currently has rights to acquisition upon request.*

APPENDIX

B LOW FREQUENCY OPERATIONAL NOISE RESULTS

Table B.1 presents total C-weighted predictions for all assessed receptors. Bolded results exceed the relevant Broner criterion (if applicable).

Table B.2 presents total C-weighted minus A-weighted (C minus A) predictions for all assessed receptors. Bracketed results indicate the corresponding predicted $L_{Aeq,15minute}$ level.

Table B.1: C-WEIGHTED OPERATIONAL NOISE LEVELS, $L_{Ceq,15minute}$ dB

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
1A	Hedley	48	50	50	47	48	48	43	46	46	42	44	44
1B	Cant	46	48	48	47	49	49	46	48	48	42	45	45
8	Marland	47	48	49	44	46	46	41	44	45	40	43	43
20A	Bosco	44	47	47	43	46	46	42	46	46	39	44	44
20B	Bosco	44	47	47	43	46	46	42	46	46	39	44	44
21	Rogers	44	47	47	42	46	46	41	45	45	38	44	44
23	Hungerford	38	45	44	36	43	42	35	41	40	30	40	39
33	Stevens and Company Pty Limited	35	41	40	36	40	39	33	36	35	30	34	33
37	Earl	33	37	36	33	36	35	33	36	34	30	33	32
38	Parkes	38	43	42	39	42	42	37	43	40	33	42	39
41	Darcy Byron Pty Ltd	44	47	47	43	46	46	41	44	44	38	43	43
46	Gleave	44	47	47	43	46	46	41	44	44	39	44	43
55	Crow	43	47	47	43	46	46	43	45	45	40	44	44
56	Lambkin	44	47	47	43	46	46	42	45	45	40	44	43

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
57	Rogers	44	47	47	43	46	46	42	44	44	39	44	43
58	Stafa	44	47	47	43	46	46	42	45	45	40	44	43
60	Poile	43	47	47	43	46	46	42	45	44	40	44	43
61	Larkin	44	47	47	44	46	46	42	45	45	39	43	43
62	Sanger	44	47	47	43	46	46	42	45	45	39	43	43
63	O'Toole	44	47	47	43	46	46	42	45	45	40	43	43
71	Garth	44	47	47	44	47	46	43	46	45	40	44	44
72	Matley	44	47	47	43	46	46	43	45	45	40	44	44
73	Hebbe and Bush	43	47	47	43	46	46	43	46	45	40	44	44
74	Towers and Maviglia	43	47	47	43	46	46	43	45	45	40	44	44
76	Chaffey	43	47	47	43	46	46	42	45	45	40	44	44
78	Smolenaers	43	47	47	43	46	46	43	45	45	40	44	44
80	Duggan	44	47	47	43	46	46	41	44	44	40	43	43
82	Mears	44	47	47	43	46	46	42	44	44	40	43	43
83	NightingaleVineyards PTY Limited	44	47	47	44	46	46	42	45	44	40	43	43
84	Stacey	44	47	47	44	47	47	42	45	45	41	44	43
85	Towns	44	47	47	44	47	47	42	45	45	41	44	44
86	Richardson	43	46	45	44	47	46	43	46	45	41	44	44

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
87	Connolly	43	46	45	44	47	46	42	46	45	41	44	43
88	Ferguson	45	48	48	45	48	47	43	47	47	41	45	44
90	Tsiolkas	43	46	45	44	47	46	42	46	45	40	44	43
91	Dunn and Wakeman	42	44	43	43	45	45	42	45	44	40	42	42
93	Danks	45	48	47	46	48	48	43	47	47	41	45	44
94	Rozene Pty Limited	45	48	48	45	48	47	43	47	46	41	45	44
95	Rozene Pty Limited	45	48	47	46	48	48	43	48	47	41	45	44
97	Lambkin	44	46	46	44	46	45	43	44	43	42	44	43
98	Fromberg	45	47	47	45	48	47	43	47	46	40	45	44
100	Calcott-McKenzie	41	45	44	41	43	42	38	41	40	34	39	38
101	Boustred Spence Turner and Cowan	44	47	47	44	48	47	43	47	46	41	44	44
102	Morsillo	45	48	47	45	48	47	43	47	46	41	45	44
103	Bell	45	48	47	46	48	47	43	47	46	41	45	44
105A	Bird and T Lambkin	44	47	46	45	47	46	44	47	46	42	45	44
105B	Bird and T Lambkin	44	45	45	44	47	46	43	47	46	42	44	43
105C	Bird and T Lambkin	44	47	46	45	47	46	44	47	46	42	45	44
108	Cowan	43	46	45	44	47	46	43	46	46	40	44	43
109	Romke	44	46	46	45	47	46	43	46	46	40	44	43

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
113B	Cowan	43	46	45	44	47	46	42	46	45	40	44	43
113A	Cowan	43	46	45	44	46	46	42	46	45	40	43	42
114	Palmer	44	47	46	45	47	47	43	47	46	40	44	44
115	Goldfinch	44	46	46	44	47	46	43	46	46	40	44	43
116	Houtzaager	43	46	45	44	46	46	42	46	45	40	43	43
117	Tolson	43	44	44	42	45	44	42	46	44	40	42	41
118	McManus	42	44	43	42	44	43	42	45	43	40	42	41
119	Hann-Devries	42	45	44	43	45	44	41	44	44	40	43	42
121B	Hope	43	46	45	45	47	46	42	46	45	40	43	43
121A	Hope	43	46	45	43	46	45	42	45	44	40	44	42
122	Warr	44	47	46	45	47	47	43	47	46	40	45	44
123	Jackson and Edwards	44	47	46	45	48	47	44	47	46	41	45	44
124	Kearns and McKell	44	47	46	45	48	47	44	47	46	41	45	44
125	Little	44	47	46	46	48	47	44	47	47	42	45	44
126A	Coranton Pty Limited	43	46	45	45	47	46	44	47	46	41	43	42
126B	Coranton Pty Limited	44	47	45	45	47	46	44	47	46	41	44	43
130	Wood	44	47	46	45	47	46	45	48	47	41	44	43
131	Gittoes	44	47	46	46	47	46	45	48	47	41	44	43

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
132	McLaughlin	45	47	46	46	48	47	45	48	47	42	45	44
137	George	44	47	45	46	47	46	45	48	47	42	44	43
138	Re	44	46	45	46	48	46	45	48	47	42	45	44
139	Logan	45	47	46	46	48	47	45	48	47	42	45	44
140	Logan	45	48	47	47	48	47	45	48	47	42	46	45
142A	Ewen	44	46	45	45	47	45	44	48	47	42	44	43
142B	Ewen	45	47	46	47	48	47	45	48	47	41	45	44
142C	Ewen	45	47	46	47	48	47	45	48	47	41	45	44
143A	Lawson	44	46	45	45	47	45	44	48	46	41	44	43
143B	Lawson	45	48	46	47	49	48	45	49	48	42	46	45
144	Bevan	44	46	45	45	47	45	44	48	46	41	44	43
145	Elsmore	44	46	45	45	46	45	43	46	45	41	44	43
149	McInerney	47	50	50	48	51	50	46	49	48	45	47	46
156B	Todhunter and Brook	42	46	45	43	47	45	41	46	44	38	43	43
156w	Todhunter and Brook	43	46	45	43	47	46	41	46	44	39	44	43
162	Lamaro	44	46	45	44	47	45	43	47	45	41	44	43
164	Sharrock	45	47	45	45	48	46	46	49	48	42	45	44
165	Garton	46	49	48	47	50	48	46	49	48	43	47	46

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
169A	McCraw	44	47	45	45	47	46	44	48	46	42	44	44
169e	McCraw	44	46	45	44	47	46	43	47	46	41	44	43
170	Owens	44	46	45	45	47	46	44	47	46	42	44	44
171	Owens	44	46	45	45	47	46	45	47	46	42	44	44
174	Kastelic	44	46	45	45	47	46	46	48	48	42	44	44
175	Grapemen Holdings Pty Limited	44	46	45	45	47	46	45	48	47	42	45	44
176	Grapemen Holdings Pty Limited	44	46	45	45	47	46	45	48	48	42	45	44
177B	Tulloch	44	46	46	45	48	47	45	48	47	42	44	44
177A	Tulloch	44	46	46	45	47	47	45	47	47	42	44	44
179	Brooks and Thompson	45	46	46	45	47	47	45	47	47	42	45	45
183	Foster	44	46	46	45	47	46	45	48	47	42	45	44
184	Esslemont Family Holdings PTY Limited	45	46	46	45	47	47	45	48	47	42	45	44
185	Poulos	44	46	46	45	47	46	45	47	47	42	45	44
188C	Tulloch	44	46	45	45	47	46	45	47	47	42	45	44
188A	Tulloch	44	46	45	45	47	46	45	47	47	42	45	44
188B	Tulloch	44	46	45	45	47	46	45	47	47	42	45	44
190	Gallagher	44	47	46	45	48	48	45	47	47	41	45	44
191	Robards and Myers	45	47	47	45	48	48	45	47	47	41	45	44

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
192	Carr	44	47	47	45	48	48	44	47	47	41	44	44
193	Britten and Herlihy	45	47	47	46	48	47	45	47	47	41	45	44
194	Smith	28	29	28	28	29	28	26	28	27	23	24	24
195	Kennedy	46	47	47	45	47	47	45	48	47	40	43	42
197	Kennedy	45	46	46	44	47	46	45	48	47	41	45	44
198	Orton	45	47	47	45	49	48	45	48	47	41	45	45
199	Gould	45	48	47	46	49	48	45	48	48	42	46	46
200	Benchoam	44	47	46	45	48	48	45	47	47	41	45	44
202	Lakayev	43	47	46	44	48	47	44	46	45	40	43	43
203	Schipper	44	47	46	45	48	47	44	47	46	41	44	44
204	Leonard	40	41	41	40	41	41	39	42	41	33	36	35
206	Helliker	40	41	41	40	41	41	39	43	42	33	37	36
207	Carr Thompson and Shearim	40	41	41	40	41	41	40	43	42	33	37	36
208	Leslie	40	41	41	40	41	41	40	43	42	33	37	36
209	Leslie	40	41	41	40	41	41	40	43	42	33	37	36
211	Brennan	44	47	46	45	48	48	45	47	47	42	44	44
212	Icelink PTY Limited	44	47	46	45	48	48	45	47	47	42	44	44
213	Icelink PTY Limited	44	47	46	45	48	47	45	46	46	42	44	43

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
214	Sydney Gas Operations PTY Ltd	43	46	46	44	47	47	44	46	46	41	43	43
217s	Russell	45	47	47	45	47	47	45	49	49	40	45	45
217m	Russell	44	47	47	45	47	47	46	48	48	40	45	45
217n	Russell	44	46	46	45	46	46	43	48	47	37	43	43
220	Purser and Keayes	45	48	48	46	48	48	45	47	47	42	45	44
221	Brasington	45	48	48	45	48	48	45	47	47	42	45	45
222	Vassallo	45	48	48	46	48	48	45	48	47	41	45	44
223	Jackson	46	48	48	46	48	48	45	48	48	42	45	45
225	Harris	45	47	47	46	47	47	45	47	47	43	44	44
226	Vassallo	46	48	48	46	48	48	45	48	48	41	44	44
227	Beavis	46	48	48	46	48	48	45	48	48	42	45	45
228	Lamb	46	48	48	47	48	48	45	48	48	42	45	45
229	Ritchie	46	48	48	47	49	48	46	48	48	42	45	45
230	Cant	46	49	49	47	49	49	46	48	48	42	45	45
231	Dawson	46	49	48	47	49	48	46	48	48	43	45	45
232	Medhurst	46	49	49	47	49	49	46	49	48	43	46	46
233	Vikas	46	49	49	47	49	49	46	48	48	42	46	46
234	Thompson	46	49	49	47	49	48	46	49	49	43	46	46

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
235	Caban	46	49	48	47	48	48	46	48	48	44	46	46
236	Krey	46	48	48	47	48	48	46	48	48	44	46	46
237	Ryan and Harrison	46	49	49	47	49	49	46	48	48	43	46	46
238	Topham	46	48	48	47	48	48	45	48	48	43	46	46
239	Waters	44	47	46	45	46	46	44	46	46	40	42	42
240	Godyn	46	49	49	47	48	48	46	48	48	43	46	46
241	Kaizer	46	49	49	47	48	48	46	48	48	43	45	45
242	Bridge	46	48	48	47	48	48	46	48	48	43	45	45
243	Neville	46	49	49	46	48	48	45	48	48	43	45	45
244	Caban	45	48	48	46	47	47	45	47	47	43	44	44
247	Upward	45	48	48	46	47	47	45	47	47	43	44	44
250	Icelink PTY Limited	45	48	47	45	48	48	45	47	47	42	45	44
254	Mitchell	45	48	48	46	47	47	45	47	47	42	44	44
256	Cameron	45	48	48	46	47	47	45	47	47	42	44	44
261	Smith	46	49	49	47	48	48	46	47	47	43	45	45
262	Smith	46	49	49	47	48	48	46	47	47	43	45	45
263	Reid	46	49	49	47	48	48	46	47	47	43	45	45
264	Reid	46	49	49	47	48	48	46	47	47	43	45	45

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
265	Turnbull	46	49	49	47	48	48	45	47	47	43	45	45
266	Hedley and Louis	46	49	49	47	48	48	45	47	47	42	45	45
272	Bulga Community Centre Incorporated	46	49	49	47	48	48	45	47	47	42	45	45
273	Silk	46	49	49	47	48	48	45	47	47	42	45	45
275	Dragicevic	46	49	49	47	48	48	45	47	47	42	45	45
276	Cooke	46	49	49	47	48	48	45	47	47	42	44	44
279	Bendall	46	49	49	47	48	48	45	47	47	42	45	45
280	Magin	46	49	49	47	48	48	45	47	47	42	44	44
281	Harris and Ferguson	46	48	48	47	48	48	45	47	47	42	44	44
283	Saunders	46	48	48	46	48	48	45	47	47	42	44	44
285	Harris	46	48	48	46	48	48	45	47	47	42	44	44
286	McLachlan	46	48	48	46	47	47	45	47	47	42	44	44
287	McLaughlin	46	48	48	46	47	47	45	47	47	42	44	44
288	Ford	46	48	48	47	48	48	45	47	47	42	44	44
289	Pringle	46	48	48	46	47	47	45	47	47	42	44	44
290	Janse van Rensburg	46	48	48	46	47	47	45	47	47	42	44	44
291	Adamthwaite	46	48	48	46	47	47	45	47	47	42	44	44
292	Evans	46	48	48	46	47	47	45	47	47	42	44	44

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
293	Gallagher	46	48	48	46	47	47	45	47	47	42	44	44
294	Brown	46	48	48	46	47	47	45	47	47	42	44	44
295	Carnevale Testa Angelatos	46	48	48	46	47	47	45	46	46	42	44	44
296	Burgess	46	48	48	46	47	47	45	47	47	42	44	44
297	Fogwell	46	48	48	46	47	47	45	47	47	42	44	44
298	Player	43	44	44	43	44	44	40	41	41	38	39	39
300	Price	40	42	42	39	41	41	38	41	41	34	37	37
301	Powell and Shannon	38	40	40	38	40	40	38	40	40	34	37	36
302	Harrison	42	44	44	40	42	42	39	41	41	35	38	38
303	McKenzie	43	45	45	44	45	45	43	45	45	39	41	41
304	Banks	45	47	47	45	46	46	44	46	46	42	43	43
305	Anderson	45	47	47	45	46	46	44	46	46	42	43	43
306	Gregory	46	48	48	46	48	48	45	47	47	42	44	44
309	Louis	45	47	47	45	46	46	44	46	46	41	43	43
311	Mulally McMaugh Burke	46	48	48	45	48	48	44	46	46	40	45	45
314	Hanson	45	47	47	45	46	46	44	46	46	41	43	43
316B	Caban	45	47	47	45	46	46	44	46	46	41	43	43
316A	Caban	45	47	47	45	46	46	44	45	45	41	43	43

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
317	Lancaster	45	47	47	45	47	47	44	45	45	40	43	43
319B	Estvale Holdings Pty Ltd	44	47	47	43	46	46	41	45	44	38	44	43
319A	Estvale Holdings Pty Ltd	44	47	47	43	46	46	41	45	45	38	44	43
323	Poulsen	47	48	48	46	47	47	44	45	46	43	45	45
324	Wood	45	47	47	43	44	45	41	43	43	39	41	42
325	Ancich	47	48	48	45	46	47	44	45	46	42	44	45
326	McNaught	37	40	40	38	40	40	37	39	39	33	36	36

Notes:

1. *Receptor 149 currently has rights to acquisition upon request; and*
2. *Bolded results denote predicted result exceeds criterion (if applicable).*

Table 7.1: C-WEIGHTED MINUS A-WEIGHTED RESULTS - dB

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
1A	Hedley	12 (36)	12 (38)	12 (38)	14 (33)	13 (35)	13 (35)	14 (29)	13 (33)	13 (33)	14 (28)	13 (31)	13 (31)
1B	Cant	15 (31)	13 (35)	14 (34)	14 (33)	14 (35)	14 (35)	15 (31)	14 (34)	14 (34)	15 (27)	15 (30)	15 (30)
8	Marland	12 (35)	11 (37)	12 (37)	14 (30)	13 (33)	13 (33)	15 (26)	14 (30)	14 (31)	16 (24)	14 (29)	13 (30)
20A	Bosco	16 (28)	15 (32)	16 (31)	15 (28)	15 (31)	15 (31)	15 (27)	15 (31)	15 (31)	14 (25)	15 (29)	15 (29)
20B	Bosco	16 (28)	15 (32)	16 (31)	15 (28)	15 (31)	15 (31)	15 (27)	15 (31)	15 (31)	14 (25)	15 (29)	15 (29)
21	Rogers	17 (27)	16 (31)	16 (31)	15 (27)	15 (31)	15 (31)	16 (25)	14 (31)	15 (30)	15 (23)	15 (29)	15 (29)
23	Hungerford	17 (21)	16 (29)	15 (29)	16 (20)	15 (28)	14 (28)	16 (19)	14 (27)	14 (26)	17 (13)	14 (26)	13 (26)
33	Stevens and Company Pty Limited	15 (20)	11 (30)	12 (28)	15 (21)	11 (29)	12 (27)	14 (19)	11 (25)	15 (20)	13 (17)	11 (23)	11 (22)
37	Earl	14 (19)	14 (23)	15 (21)	14 (19)	14 (22)	15 (20)	14 (19)	15 (21)	14 (20)	13 (17)	13 (20)	13 (19)
38	Parkes	14 (24)	13 (30)	13 (29)	14 (25)	12 (30)	14 (28)	16 (21)	13 (30)	13 (27)	14 (19)	12 (30)	13 (26)
41	Darcy Byron Pty Ltd	13 (31)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	13 (28)	13 (31)	14 (30)	13 (25)	12 (31)	13 (30)
46	Gleave	13 (31)	13 (34)	13 (34)	13 (30)	13 (33)	14 (32)	13 (28)	13 (31)	14 (30)	13 (26)	14 (30)	13 (30)
55	Crow	12 (31)	13 (34)	13 (34)	13 (30)	12 (34)	13 (33)	15 (28)	13 (32)	13 (32)	13 (27)	13 (31)	13 (31)
56	Lambkin	13 (31)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	14 (28)	13 (32)	13 (32)	14 (26)	13 (31)	13 (30)
57	Rogers	13 (31)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	13 (29)	12 (32)	12 (32)	13 (26)	13 (31)	13 (30)
58	Stafa	13 (31)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	14 (28)	13 (32)	13 (32)	13 (27)	13 (31)	13 (30)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
60	Poile	13 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	14 (28)	13 (32)	13 (31)	13 (27)	13 (31)	13 (30)
61	Larkin	13 (31)	13 (34)	13 (34)	14 (30)	13 (33)	13 (33)	13 (29)	13 (32)	13 (32)	13 (26)	12 (31)	13 (30)
62	Sanger	13 (31)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	14 (28)	13 (32)	13 (32)	13 (26)	12 (31)	13 (30)
63	O'Toole	14 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	14 (28)	14 (31)	14 (31)	14 (26)	13 (30)	13 (30)
71	Garth	13 (31)	12 (35)	13 (34)	14 (30)	13 (34)	13 (33)	14 (29)	13 (33)	12 (33)	14 (26)	13 (31)	14 (30)
72	Matley	14 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	15 (28)	13 (32)	13 (32)	13 (27)	13 (31)	14 (30)
73	Hebbe and Bush	13 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	15 (28)	14 (32)	13 (32)	13 (27)	13 (31)	14 (30)
74	Towers and Maviglia	13 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	15 (28)	13 (32)	13 (32)	13 (27)	13 (31)	14 (30)
76	Chaffey	13 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	14 (28)	13 (32)	13 (32)	13 (27)	13 (31)	14 (30)
78	Smolenaers	13 (30)	13 (34)	13 (34)	13 (30)	13 (33)	13 (33)	15 (28)	13 (32)	13 (32)	13 (27)	13 (31)	14 (30)
80	Duggan	14 (30)	14 (33)	14 (33)	14 (29)	14 (32)	14 (32)	13 (28)	13 (31)	14 (30)	14 (26)	13 (30)	14 (29)
82	Mears	14 (30)	14 (33)	14 (33)	14 (29)	14 (32)	14 (32)	14 (28)	13 (31)	14 (30)	14 (26)	14 (29)	14 (29)
83	NightingaleVineyards PTY Limited	14 (30)	14 (33)	14 (33)	15 (29)	13 (33)	13 (33)	13 (29)	14 (31)	13 (31)	14 (26)	13 (30)	14 (29)
84	Stacey	14 (30)	14 (33)	14 (33)	14 (30)	13 (34)	14 (33)	13 (29)	13 (32)	14 (31)	14 (27)	14 (30)	13 (30)
85	Towns	14 (30)	14 (33)	14 (33)	14 (30)	13 (34)	14 (33)	13 (29)	13 (32)	14 (31)	14 (27)	14 (30)	14 (30)
86	Richardson	14 (29)	14 (32)	13 (32)	14 (30)	13 (34)	13 (33)	14 (29)	13 (33)	13 (32)	14 (27)	13 (31)	14 (30)
87	Connolly	14 (29)	13 (33)	13 (32)	14 (30)	13 (34)	13 (33)	14 (28)	12 (34)	13 (32)	14 (27)	13 (31)	13 (30)
88	Ferguson	14 (31)	13 (35)	14 (34)	14 (31)	13 (35)	13 (34)	14 (29)	12 (35)	14 (33)	14 (27)	13 (32)	13 (31)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
90	Tsiolkas	14 (29)	14 (32)	14 (31)	14 (30)	14 (33)	14 (32)	13 (29)	13 (33)	13 (32)	14 (26)	14 (30)	14 (29)
91	Dunn and Wakeman	14 (28)	14 (30)	13 (30)	14 (29)	13 (32)	14 (31)	13 (29)	13 (32)	13 (31)	14 (26)	13 (29)	14 (28)
93	Danks	14 (31)	14 (34)	13 (34)	14 (32)	13 (35)	14 (34)	13 (30)	13 (34)	14 (33)	14 (27)	14 (31)	14 (30)
94	Rozene Pty Limited	13 (32)	13 (35)	13 (35)	13 (32)	13 (35)	13 (34)	13 (30)	12 (35)	12 (34)	13 (28)	13 (32)	13 (31)
95	Rozene Pty Limited	13 (32)	13 (35)	12 (35)	14 (32)	12 (36)	13 (35)	13 (30)	13 (35)	13 (34)	13 (28)	13 (32)	13 (31)
97	Lambkin	13 (31)	12 (34)	13 (33)	13 (31)	12 (34)	12 (33)	10 (33)	12 (32)	12 (31)	13 (29)	12 (32)	12 (31)
98	Fromberg	15 (30)	14 (33)	14 (33)	14 (31)	14 (34)	14 (33)	14 (29)	14 (33)	14 (32)	14 (26)	15 (30)	15 (29)
100	Calcott-McKenzie	13 (28)	14 (31)	13 (31)	14 (27)	13 (30)	13 (29)	14 (24)	14 (27)	14 (26)	13 (21)	13 (26)	13 (25)
101	Boustred Spence Turner and Cowan	13 (31)	12 (35)	13 (34)	13 (31)	13 (35)	14 (33)	13 (30)	13 (34)	13 (33)	14 (27)	13 (31)	14 (30)
102	Morsillo	14 (31)	13 (35)	13 (34)	13 (32)	13 (35)	13 (34)	13 (30)	13 (34)	13 (33)	14 (27)	14 (31)	14 (30)
103	Bell	13 (32)	13 (35)	13 (34)	14 (32)	13 (35)	13 (34)	13 (30)	13 (34)	13 (33)	13 (28)	13 (32)	13 (31)
105A	Bird and T Lambkin	13 (31)	13 (34)	13 (33)	13 (32)	12 (35)	13 (33)	12 (32)	12 (35)	13 (33)	13 (29)	13 (32)	13 (31)
105B	Bird and T Lambkin	14 (30)	13 (32)	14 (31)	13 (31)	13 (34)	14 (32)	12 (31)	13 (34)	13 (33)	14 (28)	13 (31)	13 (30)
105C	Bird and T Lambkin	13 (31)	13 (34)	13 (33)	13 (32)	12 (35)	13 (33)	12 (32)	12 (35)	13 (33)	13 (29)	13 (32)	13 (31)
108	Cowan	14 (29)	14 (32)	14 (31)	14 (30)	14 (33)	14 (32)	14 (29)	13 (33)	14 (32)	14 (26)	14 (30)	14 (29)
109	Romke	15 (29)	14 (32)	15 (31)	15 (30)	14 (33)	14 (32)	15 (28)	14 (32)	14 (32)	14 (26)	15 (29)	14 (29)
113B	Cowan	14 (29)	14 (32)	14 (31)	14 (30)	15 (32)	15 (31)	14 (28)	14 (32)	14 (31)	15 (25)	15 (29)	15 (28)
113A	Cowan	14 (29)	14 (32)	14 (31)	14 (30)	14 (32)	15 (31)	14 (28)	13 (33)	14 (31)	14 (26)	14 (29)	14 (28)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
114	Palmer	15 (29)	15 (32)	15 (31)	15 (30)	15 (32)	16 (31)	15 (28)	15 (32)	15 (31)	15 (25)	15 (29)	16 (28)
115	Goldfinch	15 (29)	14 (32)	15 (31)	14 (30)	14 (33)	15 (31)	15 (28)	14 (32)	15 (31)	15 (25)	15 (29)	15 (28)
116	Houtzaager	14 (29)	15 (31)	14 (31)	14 (30)	14 (32)	15 (31)	14 (28)	14 (32)	14 (31)	14 (26)	14 (29)	15 (28)
117	Tolson	14 (29)	13 (31)	14 (30)	13 (29)	14 (31)	14 (30)	13 (29)	14 (32)	13 (31)	14 (26)	13 (29)	13 (28)
118	McManus	14 (28)	14 (30)	14 (29)	14 (28)	13 (31)	13 (30)	13 (29)	14 (31)	13 (30)	14 (26)	14 (28)	14 (27)
119	Hann-Devries	14 (28)	14 (31)	14 (30)	14 (29)	13 (32)	13 (31)	14 (27)	14 (30)	14 (30)	15 (25)	14 (29)	14 (28)
121B	Hope	14 (29)	13 (33)	14 (31)	14 (31)	13 (34)	14 (32)	13 (29)	14 (32)	14 (31)	14 (26)	13 (30)	14 (29)
121A	Hope	14 (29)	13 (33)	14 (31)	13 (30)	13 (33)	14 (31)	14 (28)	13 (32)	14 (30)	14 (26)	14 (30)	13 (29)
122	Warr	15 (29)	15 (32)	15 (31)	15 (30)	14 (33)	15 (32)	14 (29)	15 (32)	15 (31)	15 (25)	16 (29)	16 (28)
123	Jackson and Edwards	15 (29)	15 (32)	15 (31)	14 (31)	15 (33)	15 (32)	14 (30)	14 (33)	14 (32)	15 (26)	15 (30)	15 (29)
124	Kearns and McKell	15 (29)	15 (32)	15 (31)	14 (31)	15 (33)	15 (32)	14 (30)	14 (33)	14 (32)	15 (26)	15 (30)	15 (29)
125	Little	15 (29)	14 (33)	15 (31)	15 (31)	14 (34)	15 (32)	14 (30)	14 (33)	15 (32)	15 (27)	15 (30)	15 (29)
126A	Coranton Pty Limited	14 (29)	13 (33)	14 (31)	14 (31)	14 (33)	14 (32)	14 (30)	14 (33)	14 (32)	15 (26)	14 (29)	14 (28)
126B	Coranton Pty Limited	15 (29)	14 (33)	14 (31)	14 (31)	13 (34)	14 (32)	14 (30)	14 (33)	14 (32)	15 (26)	15 (29)	15 (28)
130	Wood	14 (30)	14 (33)	15 (31)	13 (32)	13 (34)	14 (32)	14 (31)	14 (34)	14 (33)	14 (27)	14 (30)	14 (29)
131	Gittoes	14 (30)	14 (33)	15 (31)	14 (32)	13 (34)	14 (32)	14 (31)	14 (34)	14 (33)	14 (27)	14 (30)	14 (29)
132	McLaughlin	15 (30)	13 (34)	15 (31)	14 (32)	14 (34)	14 (33)	14 (31)	13 (35)	14 (33)	15 (27)	14 (31)	14 (30)
137	George	14 (30)	14 (33)	14 (31)	14 (32)	13 (34)	13 (33)	14 (31)	13 (35)	14 (33)	14 (28)	13 (31)	13 (30)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
138	Re	14 (30)	13 (33)	14 (31)	13 (33)	14 (34)	13 (33)	14 (31)	13 (35)	13 (34)	14 (28)	14 (31)	14 (30)
139	Logan	15 (30)	13 (34)	14 (32)	14 (32)	14 (34)	14 (33)	14 (31)	13 (35)	13 (34)	15 (27)	14 (31)	14 (30)
140	Logan	14 (31)	14 (34)	15 (32)	15 (32)	14 (34)	14 (33)	14 (31)	13 (35)	14 (33)	15 (27)	15 (31)	15 (30)
142A	Ewen	14 (30)	14 (32)	14 (31)	13 (32)	13 (34)	13 (32)	14 (30)	12 (36)	14 (33)	15 (27)	13 (31)	14 (29)
142B	Ewen	14 (31)	13 (34)	14 (32)	14 (33)	13 (35)	14 (33)	14 (31)	13 (35)	14 (33)	14 (27)	14 (31)	15 (29)
142C	Ewen	14 (31)	13 (34)	14 (32)	14 (33)	13 (35)	14 (33)	14 (31)	13 (35)	14 (33)	14 (27)	14 (31)	15 (29)
143A	Lawson	13 (31)	14 (32)	14 (31)	14 (31)	14 (33)	14 (31)	14 (30)	13 (35)	13 (33)	14 (27)	14 (30)	14 (29)
143B	Lawson	14 (31)	14 (34)	14 (32)	14 (33)	14 (35)	15 (33)	14 (31)	13 (36)	14 (34)	14 (28)	14 (32)	15 (30)
144	Bevan	14 (30)	14 (32)	15 (30)	14 (31)	13 (34)	13 (32)	14 (30)	13 (35)	14 (32)	14 (27)	14 (30)	14 (29)
145	Elsmore	13 (31)	14 (32)	14 (31)	13 (32)	13 (33)	13 (32)	13 (30)	12 (34)	13 (32)	14 (27)	13 (31)	14 (29)
149	McInerney	11 (36)	12 (38)	13 (37)	12 (36)	12 (39)	12 (38)	12 (34)	11 (38)	12 (36)	13 (32)	11 (36)	12 (34)
156B	Todhunter and Brook	13 (29)	13 (33)	13 (32)	13 (30)	13 (34)	12 (33)	14 (27)	14 (32)	13 (31)	14 (24)	13 (30)	14 (29)
156w	Todhunter and Brook	12 (31)	12 (34)	13 (32)	12 (31)	13 (34)	13 (33)	13 (28)	14 (32)	13 (31)	14 (25)	14 (30)	14 (29)
162	Lamaro	12 (32)	13 (33)	14 (31)	13 (31)	13 (34)	13 (32)	14 (29)	13 (34)	13 (32)	14 (27)	14 (30)	13 (30)
164	Sharrock	14 (31)	14 (33)	14 (31)	13 (32)	14 (34)	13 (33)	14 (32)	13 (36)	13 (35)	14 (28)	14 (31)	14 (30)
165	Garton	15 (31)	14 (35)	15 (33)	14 (33)	14 (36)	15 (33)	14 (32)	13 (36)	13 (35)	15 (28)	15 (32)	15 (31)
169A	McCraw	13 (31)	14 (33)	13 (32)	13 (32)	13 (34)	14 (32)	14 (30)	14 (34)	13 (33)	15 (27)	14 (30)	15 (29)
169e	McCraw	12 (32)	13 (33)	14 (31)	13 (31)	13 (34)	13 (33)	14 (29)	13 (34)	14 (32)	14 (27)	14 (30)	14 (29)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
170	Owens	13 (31)	13 (33)	13 (32)	13 (32)	14 (33)	14 (32)	14 (30)	13 (34)	13 (33)	15 (27)	13 (31)	15 (29)
171	Owens	12 (32)	13 (33)	13 (32)	13 (32)	13 (34)	13 (33)	15 (30)	13 (34)	13 (33)	15 (27)	14 (30)	15 (29)
174	Kastelic	14 (30)	13 (33)	14 (31)	13 (32)	14 (33)	14 (32)	14 (32)	13 (35)	14 (34)	15 (27)	13 (31)	15 (29)
175	Grapemen Holdings Pty Limited	13 (31)	13 (33)	13 (32)	14 (31)	14 (33)	14 (32)	15 (30)	13 (35)	13 (34)	15 (27)	14 (31)	14 (30)
176	Grapemen Holdings Pty Limited	13 (31)	13 (33)	13 (32)	14 (31)	13 (34)	13 (33)	14 (31)	13 (35)	14 (34)	15 (27)	14 (31)	14 (30)
177B	Tulloch	14 (30)	14 (32)	15 (31)	13 (32)	14 (34)	14 (33)	14 (31)	14 (34)	13 (34)	16 (26)	14 (30)	14 (30)
177A	Tulloch	13 (31)	14 (32)	15 (31)	13 (32)	14 (33)	15 (32)	15 (30)	13 (34)	14 (33)	16 (26)	14 (30)	14 (30)
179	Brooks and Thompson	12 (33)	12 (34)	13 (33)	14 (31)	12 (35)	13 (34)	14 (31)	13 (34)	14 (33)	14 (28)	14 (31)	15 (30)
183	Foster	12 (32)	13 (33)	13 (33)	13 (32)	13 (34)	13 (33)	14 (31)	13 (35)	13 (34)	15 (27)	14 (31)	14 (30)
184	Esslemont Family Holdings PTY Limited	13 (32)	13 (33)	13 (33)	13 (32)	13 (34)	13 (34)	15 (30)	13 (35)	13 (34)	15 (27)	14 (31)	14 (30)
185	Poulos	12 (32)	13 (33)	14 (32)	13 (32)	13 (34)	13 (33)	15 (30)	13 (34)	13 (34)	15 (27)	14 (31)	14 (30)
188C	Tulloch	13 (31)	14 (32)	13 (32)	13 (32)	13 (34)	14 (32)	15 (30)	13 (34)	14 (33)	16 (26)	14 (31)	14 (30)
188A	Tulloch	13 (31)	14 (32)	13 (32)	13 (32)	14 (33)	14 (32)	15 (30)	13 (34)	14 (33)	16 (26)	14 (31)	14 (30)
188B	Tulloch	13 (31)	14 (32)	13 (32)	13 (32)	13 (34)	14 (32)	15 (30)	13 (34)	14 (33)	16 (26)	14 (31)	14 (30)
190	Gallagher	15 (29)	15 (32)	14 (32)	15 (30)	15 (33)	16 (32)	16 (29)	14 (33)	15 (32)	16 (25)	16 (29)	16 (28)
191	Robards and Myers	16 (29)	14 (33)	15 (32)	15 (30)	14 (34)	15 (33)	16 (29)	14 (33)	15 (32)	16 (25)	16 (29)	16 (28)
192	Carr	15 (29)	14 (33)	15 (32)	15 (30)	15 (33)	15 (33)	15 (29)	15 (32)	15 (32)	16 (25)	15 (29)	16 (28)
193	Britten and Herlihy	16 (29)	15 (32)	15 (32)	16 (30)	15 (33)	15 (32)	16 (29)	15 (32)	16 (31)	16 (25)	17 (28)	16 (28)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
194	Smith	17 (11)	17 (12)	17 (11)	17 (11)	18 (11)	17 (11)	16 (10)	18 (10)	17 (10)	13 (10)	14 (10)	14 (10)
195	Kennedy	14 (32)	13 (34)	14 (33)	13 (32)	13 (34)	13 (34)	15 (30)	12 (36)	13 (34)	15 (25)	13 (30)	13 (29)
197	Kennedy	12 (33)	13 (33)	14 (32)	13 (31)	13 (34)	13 (33)	13 (32)	13 (35)	13 (34)	15 (26)	14 (31)	14 (30)
198	Orton	15 (30)	14 (33)	16 (31)	14 (31)	15 (34)	15 (33)	15 (30)	14 (34)	14 (33)	15 (26)	15 (30)	15 (30)
199	Gould	15 (30)	15 (33)	15 (32)	15 (31)	15 (34)	15 (33)	15 (30)	15 (33)	15 (33)	17 (25)	16 (30)	17 (29)
200	Benchoam	15 (29)	14 (33)	15 (31)	14 (31)	14 (34)	15 (33)	15 (30)	14 (33)	14 (33)	15 (26)	15 (30)	15 (29)
202	Lakayev	14 (29)	14 (33)	14 (32)	15 (29)	15 (33)	15 (32)	15 (29)	15 (31)	14 (31)	16 (24)	15 (28)	16 (27)
203	Schipper	15 (29)	14 (33)	14 (32)	15 (30)	15 (33)	15 (32)	15 (29)	15 (32)	14 (32)	15 (26)	15 (29)	16 (28)
204	Leonard	16 (24)	15 (26)	16 (25)	16 (24)	15 (26)	16 (25)	15 (24)	15 (27)	15 (26)	17 (16)	16 (20)	16 (19)
206	Helliker	15 (25)	15 (26)	16 (25)	16 (24)	16 (25)	16 (25)	15 (24)	16 (27)	15 (27)	16 (17)	16 (21)	16 (20)
207	Carr Thompson and Shearim	16 (24)	15 (26)	16 (25)	16 (24)	16 (25)	16 (25)	16 (24)	15 (28)	15 (27)	16 (17)	16 (21)	16 (20)
208	Leslie	15 (25)	15 (26)	16 (25)	16 (24)	16 (25)	16 (25)	16 (24)	16 (27)	15 (27)	16 (17)	16 (21)	16 (20)
209	Leslie	15 (25)	15 (26)	16 (25)	16 (24)	16 (25)	16 (25)	15 (25)	16 (27)	15 (27)	16 (17)	16 (21)	16 (20)
211	Brennan	15 (29)	14 (33)	15 (31)	14 (31)	14 (34)	15 (33)	15 (30)	14 (33)	14 (33)	16 (26)	15 (29)	15 (29)
212	Icelink PTY Limited	15 (29)	14 (33)	14 (32)	14 (31)	14 (34)	15 (33)	15 (30)	14 (33)	14 (33)	15 (27)	15 (29)	15 (29)
213	Icelink PTY Limited	16 (28)	14 (33)	15 (31)	15 (30)	15 (33)	15 (32)	15 (30)	14 (32)	14 (32)	16 (26)	16 (28)	15 (28)
214	Sydney Gas Operations PTY Ltd	15 (28)	14 (32)	15 (31)	15 (29)	15 (32)	16 (31)	15 (29)	15 (31)	15 (31)	15 (26)	15 (28)	16 (27)
217s	Russell	13 (32)	14 (33)	14 (33)	13 (32)	14 (33)	14 (33)	13 (32)	13 (36)	13 (36)	14 (26)	13 (32)	14 (31)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
217m	Russell	14 (30)	14 (33)	15 (32)	15 (30)	14 (33)	14 (33)	14 (32)	13 (35)	13 (35)	14 (26)	13 (32)	13 (32)
217n	Russell	13 (31)	15 (31)	15 (31)	12 (33)	14 (32)	14 (32)	15 (28)	13 (35)	13 (34)	15 (22)	13 (30)	14 (29)
220	Purser and Keayes	15 (30)	14 (34)	15 (33)	15 (31)	15 (33)	15 (33)	14 (31)	14 (33)	14 (33)	16 (26)	16 (29)	15 (29)
221	Brasington	15 (30)	14 (34)	15 (33)	14 (31)	15 (33)	15 (33)	15 (30)	14 (33)	14 (33)	15 (27)	16 (29)	16 (29)
222	Vassallo	14 (31)	14 (34)	15 (33)	14 (32)	14 (34)	14 (34)	14 (31)	14 (34)	13 (34)	15 (26)	15 (30)	14 (30)
223	Jackson	16 (30)	14 (34)	14 (34)	14 (32)	14 (34)	15 (33)	14 (31)	15 (33)	15 (33)	15 (27)	15 (30)	16 (29)
225	Harris	15 (30)	15 (32)	15 (32)	16 (30)	15 (32)	15 (32)	16 (29)	16 (31)	16 (31)	17 (26)	16 (28)	16 (28)
226	Vassallo	15 (31)	14 (34)	14 (34)	14 (32)	14 (34)	14 (34)	14 (31)	14 (34)	14 (34)	15 (26)	14 (30)	14 (30)
227	Beavis	15 (31)	14 (34)	14 (34)	14 (32)	14 (34)	14 (34)	14 (31)	14 (34)	14 (34)	16 (26)	15 (30)	16 (29)
228	Lamb	15 (31)	14 (34)	14 (34)	14 (33)	14 (34)	14 (34)	14 (31)	14 (34)	14 (34)	16 (26)	15 (30)	15 (30)
229	Ritchie	15 (31)	14 (34)	14 (34)	14 (33)	15 (34)	14 (34)	15 (31)	14 (34)	14 (34)	15 (27)	15 (30)	16 (29)
230	Cant	14 (32)	14 (35)	14 (35)	13 (34)	14 (35)	14 (35)	14 (32)	13 (35)	14 (34)	15 (27)	15 (30)	15 (30)
231	Dawson	14 (32)	14 (35)	13 (35)	14 (33)	15 (34)	14 (34)	15 (31)	14 (34)	14 (34)	16 (27)	15 (30)	15 (30)
232	Medhurst	14 (32)	13 (36)	13 (36)	13 (34)	14 (35)	14 (35)	14 (32)	14 (35)	13 (35)	15 (28)	14 (32)	14 (32)
233	Vikas	14 (32)	14 (35)	14 (35)	13 (34)	14 (35)	14 (35)	14 (32)	13 (35)	14 (34)	15 (27)	15 (31)	15 (31)
234	Thompson	14 (32)	13 (36)	14 (35)	14 (33)	15 (34)	14 (34)	15 (31)	14 (35)	15 (34)	16 (27)	15 (31)	15 (31)
235	Caban	14 (32)	14 (35)	13 (35)	14 (33)	14 (34)	14 (34)	16 (30)	14 (34)	14 (34)	17 (27)	16 (30)	16 (30)
236	Krey	15 (31)	14 (34)	14 (34)	15 (32)	15 (33)	15 (33)	16 (30)	15 (33)	15 (33)	17 (27)	16 (30)	16 (30)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
237	Ryan and Harrison	14 (32)	13 (36)	13 (36)	14 (33)	15 (34)	15 (34)	15 (31)	14 (34)	14 (34)	15 (28)	15 (31)	15 (31)
238	Topham	14 (32)	13 (35)	13 (35)	15 (32)	15 (33)	15 (33)	15 (30)	15 (33)	15 (33)	16 (27)	16 (30)	16 (30)
239	Waters	14 (30)	14 (33)	13 (33)	14 (31)	14 (32)	15 (31)	14 (30)	13 (33)	13 (33)	16 (24)	15 (27)	15 (27)
240	Godyn	15 (31)	13 (36)	13 (36)	14 (33)	14 (34)	14 (34)	15 (31)	14 (34)	14 (34)	15 (28)	15 (31)	15 (31)
241	Kaizer	15 (31)	14 (35)	14 (35)	15 (32)	15 (33)	15 (33)	16 (30)	15 (33)	15 (33)	16 (27)	15 (30)	15 (30)
242	Bridge	15 (31)	13 (35)	13 (35)	15 (32)	15 (33)	15 (33)	16 (30)	15 (33)	15 (33)	16 (27)	15 (30)	15 (30)
243	Neville	15 (31)	14 (35)	14 (35)	14 (32)	15 (33)	15 (33)	15 (30)	15 (33)	15 (33)	16 (27)	15 (30)	15 (30)
244	Caban	15 (30)	14 (34)	14 (34)	15 (31)	15 (32)	15 (32)	16 (29)	15 (32)	15 (32)	16 (27)	15 (29)	15 (29)
247	Upward	15 (30)	15 (33)	15 (33)	16 (30)	15 (32)	15 (32)	16 (29)	16 (31)	16 (31)	17 (26)	16 (28)	16 (28)
250	Icelink PTY Limited	15 (30)	14 (34)	14 (33)	14 (31)	15 (33)	15 (33)	14 (31)	14 (33)	14 (33)	15 (27)	16 (29)	15 (29)
254	Mitchell	14 (31)	13 (35)	13 (35)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	15 (27)	15 (29)	15 (29)
256	Cameron	14 (31)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	15 (27)	16 (28)	16 (28)
261	Smith	14 (32)	13 (36)	13 (36)	14 (33)	14 (34)	14 (34)	15 (31)	13 (34)	13 (34)	16 (27)	15 (30)	15 (30)
262	Smith	14 (32)	13 (36)	13 (36)	14 (33)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	16 (27)	15 (30)	15 (30)
263	Reid	14 (32)	13 (36)	13 (36)	15 (32)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	16 (27)	15 (30)	15 (30)
264	Reid	14 (32)	13 (36)	13 (36)	14 (33)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	16 (27)	15 (30)	15 (30)
265	Turnbull	14 (32)	13 (36)	13 (36)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	16 (27)	16 (29)	16 (29)
266	Hedley and Louis	14 (32)	13 (36)	13 (36)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	16 (29)	16 (29)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
272	Bulga Community Centre Incorporated	14 (32)	13 (36)	13 (36)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	16 (29)	16 (29)
273	Silk	14 (32)	14 (35)	14 (35)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	16 (29)	16 (29)
275	Dragicevic	14 (32)	14 (35)	14 (35)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	16 (29)	16 (29)
276	Cooke	14 (32)	14 (35)	14 (35)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	16 (26)	15 (29)	15 (29)
279	Bendall	14 (32)	14 (35)	14 (35)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	16 (29)	16 (29)
280	Magin	14 (32)	14 (35)	14 (35)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	15 (29)	15 (29)
281	Harris and Ferguson	14 (32)	13 (35)	13 (35)	15 (32)	14 (34)	14 (34)	14 (31)	14 (33)	14 (33)	15 (27)	15 (29)	15 (29)
283	Saunders	14 (32)	13 (35)	13 (35)	14 (32)	15 (33)	15 (33)	15 (30)	14 (33)	14 (33)	16 (26)	15 (29)	15 (29)
285	Harris	14 (32)	13 (35)	13 (35)	14 (32)	15 (33)	15 (33)	15 (30)	15 (32)	15 (32)	16 (26)	15 (29)	15 (29)
286	McLachlan	14 (32)	13 (35)	13 (35)	14 (32)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	15 (29)	15 (29)
287	McLaughlin	14 (32)	13 (35)	13 (35)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	15 (29)	15 (29)
288	Ford	14 (32)	13 (35)	13 (35)	15 (32)	15 (33)	15 (33)	15 (30)	14 (33)	14 (33)	16 (26)	15 (29)	15 (29)
289	Pringle	15 (31)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)
290	Janse van Rensburg	15 (31)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)
291	Adamthwaite	15 (31)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)
292	Evans	15 (31)	14 (34)	14 (34)	14 (32)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)
293	Gallagher	15 (31)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)
294	Brown	15 (31)	14 (34)	14 (34)	15 (31)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
295	Carnevale Testa Angelatos	15 (31)	14 (34)	14 (34)	15 (31)	15 (32)	15 (32)	15 (30)	14 (32)	14 (32)	16 (26)	16 (28)	16 (28)
296	Burgess	15 (31)	14 (34)	14 (34)	15 (31)	15 (32)	15 (32)	15 (30)	16 (31)	16 (31)	16 (26)	16 (28)	16 (28)
297	Fogwell	15 (31)	14 (34)	14 (34)	15 (31)	15 (32)	15 (32)	15 (30)	16 (31)	16 (31)	16 (26)	16 (28)	16 (28)
298	Player	15 (28)	14 (30)	14 (30)	15 (28)	15 (29)	15 (29)	16 (24)	15 (26)	15 (26)	17 (21)	16 (23)	16 (23)
300	Price	15 (25)	15 (27)	15 (27)	16 (23)	16 (25)	16 (25)	15 (23)	15 (26)	15 (26)	16 (18)	16 (21)	16 (21)
301	Powell and Shannon	16 (22)	16 (24)	16 (24)	15 (23)	15 (25)	15 (25)	16 (22)	15 (25)	15 (25)	16 (18)	16 (21)	15 (21)
302	Harrison	15 (27)	16 (28)	16 (28)	15 (25)	16 (26)	16 (26)	16 (23)	15 (26)	15 (26)	16 (19)	16 (22)	16 (22)
303	McKenzie	15 (28)	16 (29)	16 (29)	15 (29)	15 (30)	15 (30)	15 (28)	15 (30)	15 (30)	16 (23)	16 (25)	16 (25)
304	Banks	15 (30)	15 (32)	15 (32)	15 (30)	15 (31)	15 (31)	15 (29)	16 (30)	16 (30)	17 (25)	16 (27)	16 (27)
305	Anderson	15 (30)	15 (32)	15 (32)	15 (30)	15 (31)	15 (31)	15 (29)	16 (30)	16 (30)	17 (25)	16 (27)	16 (27)
306	Gregory	15 (31)	14 (34)	14 (34)	14 (32)	15 (33)	15 (33)	15 (30)	15 (32)	15 (32)	16 (26)	16 (28)	16 (28)
309	Louis	15 (30)	14 (33)	14 (33)	15 (30)	14 (32)	14 (32)	15 (29)	15 (31)	15 (31)	16 (25)	16 (27)	16 (27)
311	Mulally McMaugh Burke	15 (31)	13 (35)	13 (35)	14 (31)	14 (34)	14 (34)	15 (29)	13 (33)	14 (32)	16 (24)	15 (30)	15 (30)
314	Hanson	15 (30)	15 (32)	15 (32)	15 (30)	14 (32)	14 (32)	15 (29)	15 (31)	15 (31)	16 (25)	16 (27)	16 (27)
316B	Caban	15 (30)	14 (33)	14 (33)	15 (30)	14 (32)	14 (32)	15 (29)	15 (31)	15 (31)	16 (25)	16 (27)	16 (27)
316A	Caban	15 (30)	15 (32)	15 (32)	15 (30)	15 (31)	15 (31)	16 (28)	15 (30)	15 (30)	16 (25)	16 (27)	16 (27)
317	Lancaster	15 (30)	14 (33)	14 (33)	15 (30)	15 (32)	15 (32)	15 (29)	14 (31)	14 (31)	16 (24)	15 (28)	15 (28)
319B	Estvale Holdings Pty Ltd	12 (32)	13 (34)	13 (34)	12 (31)	13 (33)	13 (33)	13 (28)	13 (32)	12 (32)	13 (25)	13 (31)	13 (30)

Receptor ID	Receptor Name	Year 4			Year 7			Year 13			Year 19		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
319A	Estvale Holdings Pty Ltd	12 (32)	13 (34)	13 (34)	12 (31)	12 (34)	13 (33)	13 (28)	13 (32)	13 (32)	13 (25)	12 (32)	13 (30)
323	Poulsen	12 (35)	12 (36)	11 (37)	13 (33)	12 (35)	12 (35)	13 (31)	13 (32)	13 (33)	13 (30)	13 (32)	13 (32)
324	Wood	12 (33)	12 (35)	11 (36)	14 (29)	13 (31)	13 (32)	16 (25)	15 (28)	14 (29)	16 (23)	15 (26)	14 (28)
325	Ancich	12 (35)	12 (36)	11 (37)	14 (31)	12 (34)	13 (34)	14 (30)	13 (32)	13 (33)	14 (28)	13 (31)	13 (32)
326	McNaught	16 (21)	16 (24)	16 (24)	16 (22)	17 (23)	17 (23)	16 (21)	15 (24)	15 (24)	17 (16)	17 (19)	17 (19)

Notes:

1. *Receptor 149 currently has rights to acquisition upon request; and*
2. *Bracketed results indicate $L_{Aeq,15minute}$ level.*

APPENDIX

C MODELLED SOURCE LOCATIONS

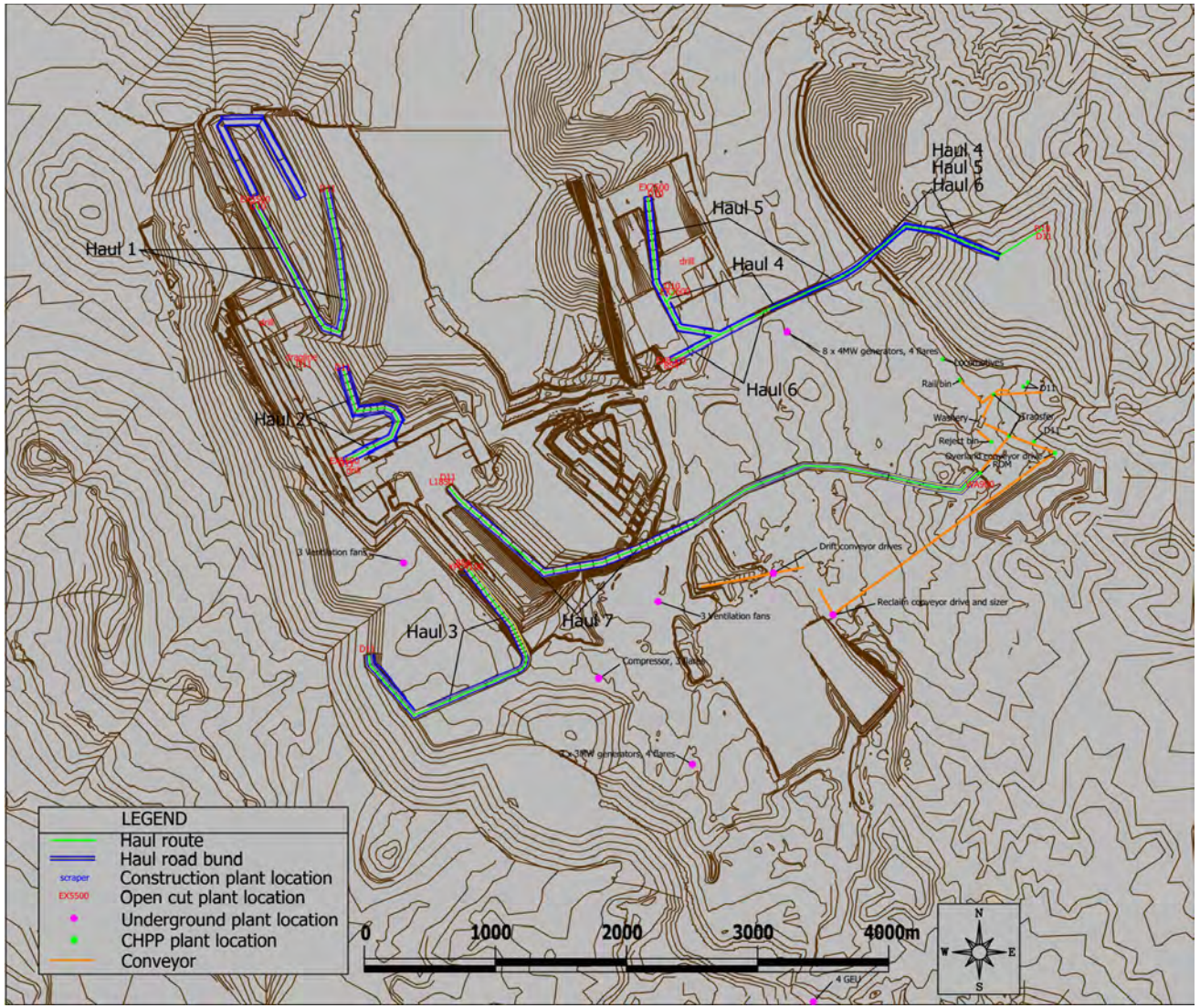

Figure C.1: Source and Bund Locations, Year 4 Day Scenario

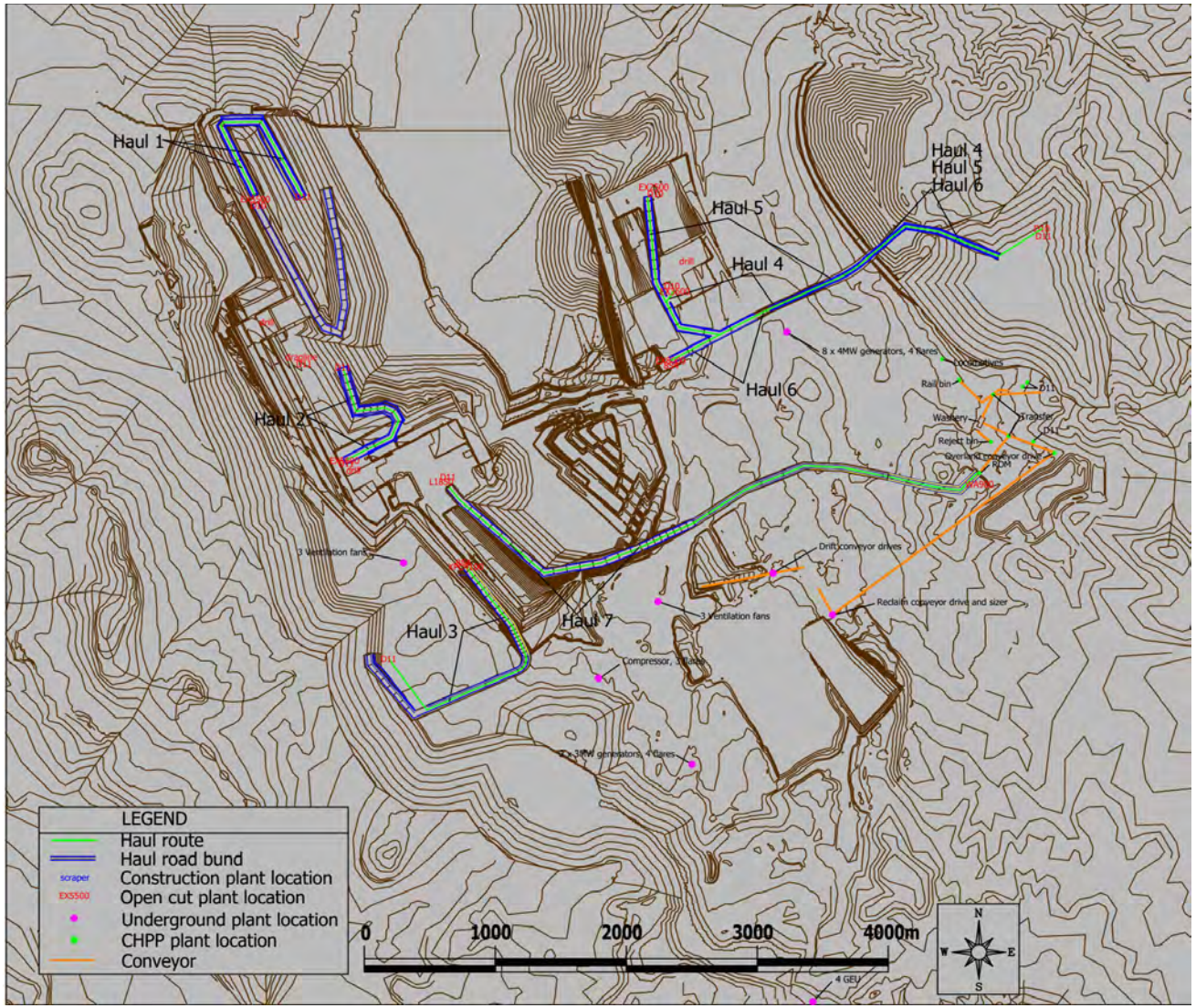

Figure C.2: Source and Bund Locations, Year 4 Evening/Night Scenario

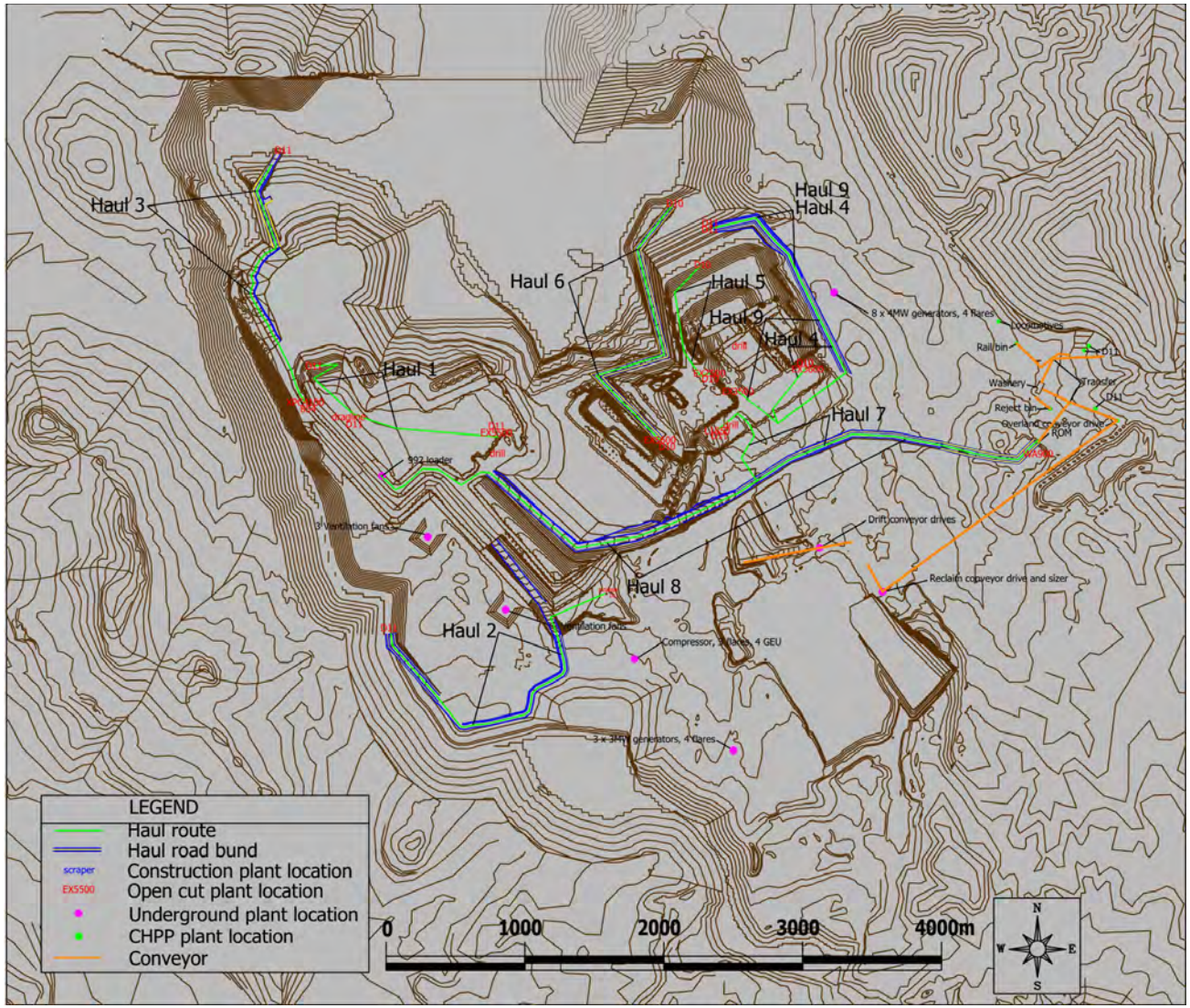

Figure C.3: Source and Bund Locations, Year 7 Day Scenario

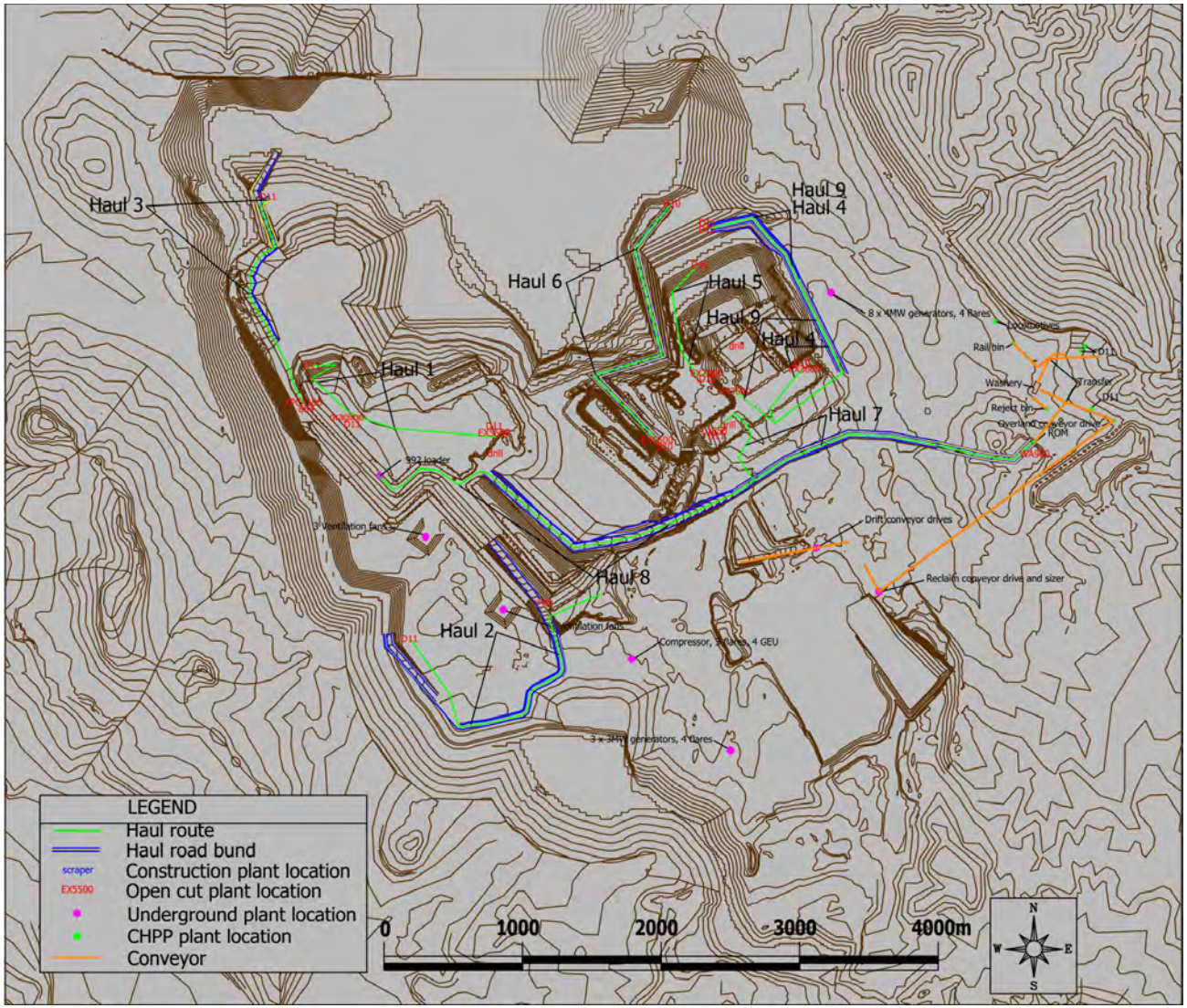

Figure C.4: Source and Bund Locations, Year 7 Evening/Night Scenario

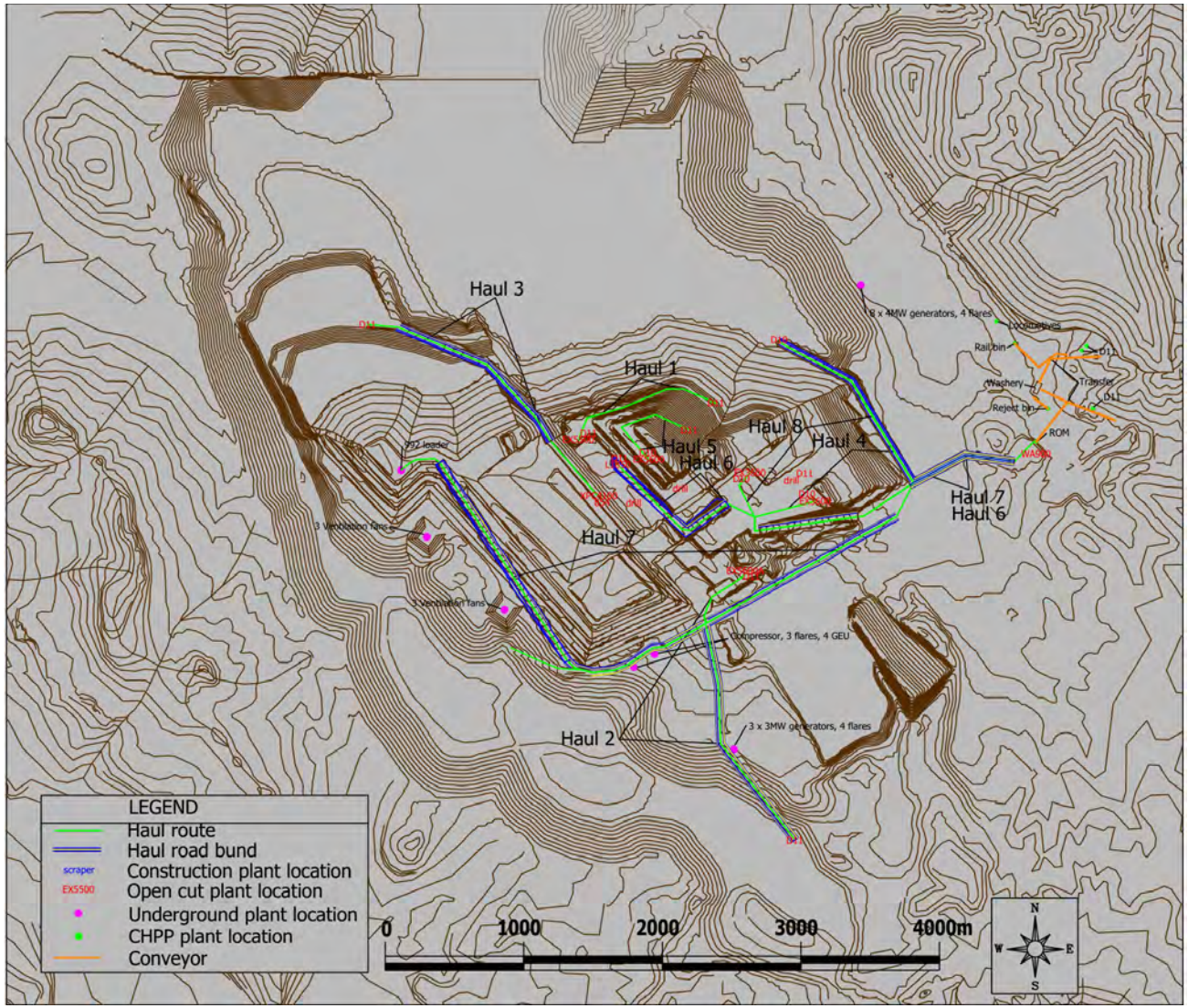

Figure C.5: Source and Bund Locations, Year 13 Day Scenario

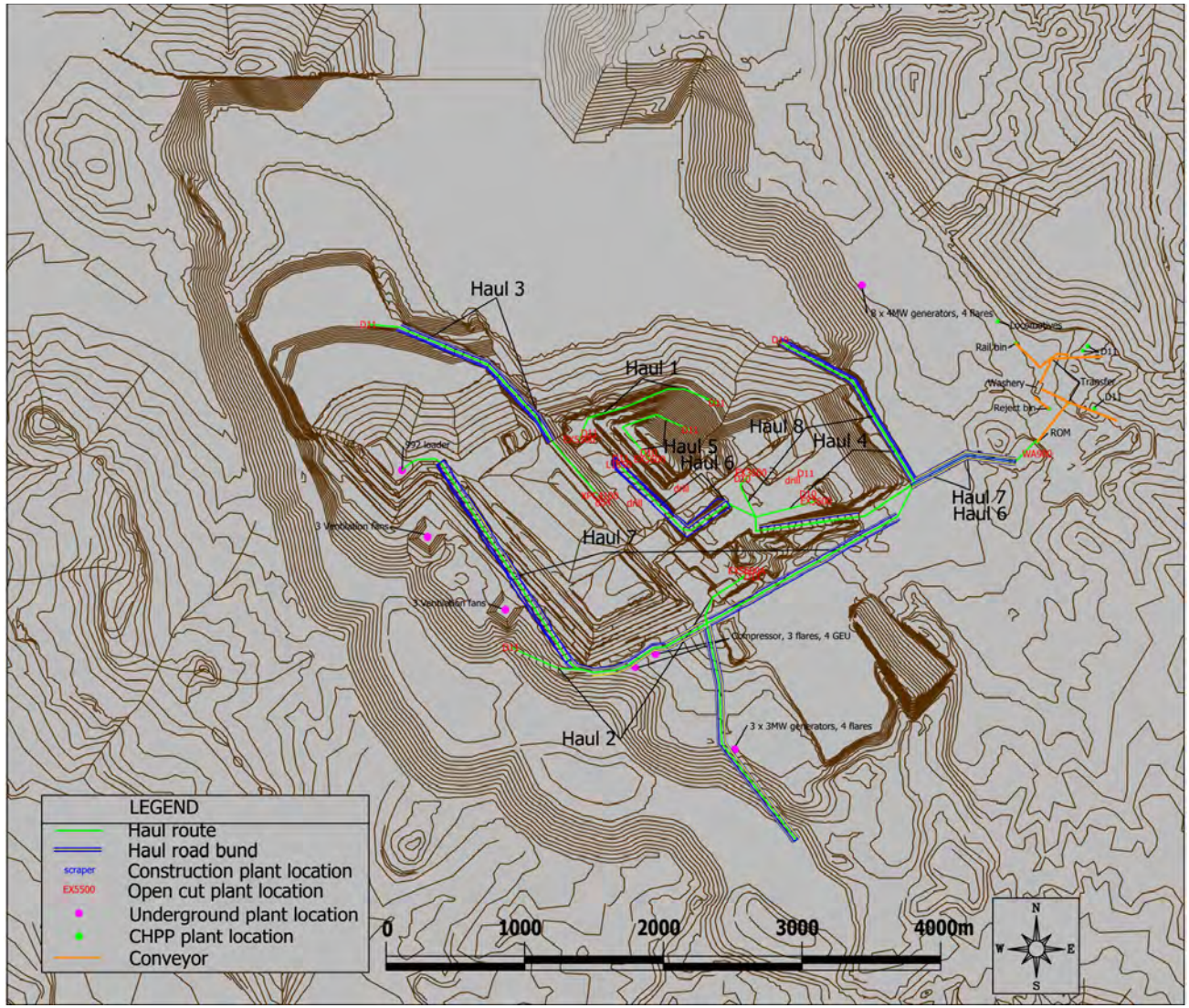

Figure C.6: Source and Bund Locations, Year 13 Evening/Night Scenario

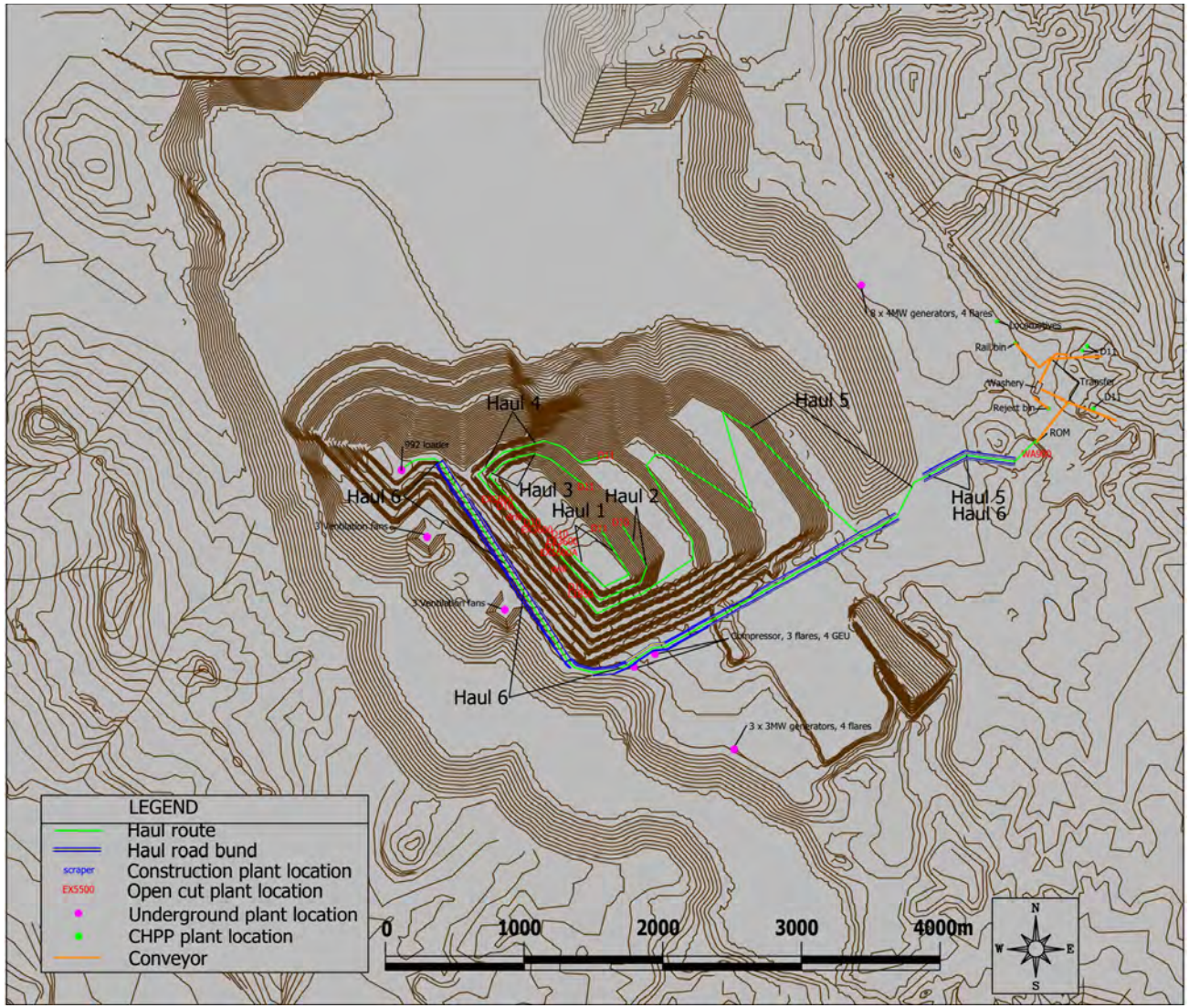

Figure C.7: Source and Bund Locations, Year 19 Day/Evening/Night Scenario

APPENDIX

D MODELLED METEOROLOGICAL CONDITIONS

Table D.1: ,MODELLED METEOROLOGICAL CONDITONS

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	0	-	-1.6
10	80	0	-	1
10	80	0	-	4
10	80	0.75	0	-1.6
10	80	0.75	22.5	-1.6
10	80	0.75	45	-1.6
10	80	0.75	67.5	-1.6
10	80	0.75	90	-1.6
10	80	0.75	112.5	-1.6
10	80	0.75	135	-1.6
10	80	0.75	157.5	-1.6
10	80	0.75	180	-1.6
10	80	0.75	202.5	-1.6
10	80	0.75	225	-1.6
10	80	0.75	247.5	-1.6
10	80	0.75	270	-1.6
10	80	0.75	292.5	-1.6
10	80	0.75	315	-1.6
10	80	0.75	337.5	-1.6
10	80	0.75	0	1
10	80	0.75	22.5	1
10	80	0.75	45	1
10	80	0.75	67.5	1
10	80	0.75	90	1
10	80	0.75	112.5	1
10	80	0.75	135	1
10	80	0.75	157.5	1
10	80	0.75	180	1
10	80	0.75	202.5	1
10	80	0.75	225	1
10	80	0.75	247.5	1
10	80	0.75	270	1
10	80	0.75	292.5	1

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	0.75	315	1
10	80	0.75	337.5	1
10	80	0.75	0	4
10	80	0.75	22.5	4
10	80	0.75	45	4
10	80	0.75	67.5	4
10	80	0.75	90	4
10	80	0.75	112.5	4
10	80	0.75	135	4
10	80	0.75	157.5	4
10	80	0.75	180	4
10	80	0.75	202.5	4
10	80	0.75	225	4
10	80	0.75	247.5	4
10	80	0.75	270	4
10	80	0.75	292.5	4
10	80	0.75	315	4
10	80	0.75	337.5	4
10	80	1.5	0	-1.6
10	80	1.5	22.5	-1.6
10	80	1.5	45	-1.6
10	80	1.5	67.5	-1.6
10	80	1.5	90	-1.6
10	80	1.5	112.5	-1.6
10	80	1.5	135	-1.6
10	80	1.5	157.5	-1.6
10	80	1.5	180	-1.6
10	80	1.5	202.5	-1.6
10	80	1.5	225	-1.6
10	80	1.5	247.5	-1.6
10	80	1.5	270	-1.6
10	80	1.5	292.5	-1.6
10	80	1.5	315	-1.6
10	80	1.5	337.5	-1.6
10	80	1.5	0	1
10	80	1.5	22.5	1

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	1.5	45	1
10	80	1.5	67.5	1
10	80	1.5	90	1
10	80	1.5	112.5	1
10	80	1.5	135	1
10	80	1.5	157.5	1
10	80	1.5	180	1
10	80	1.5	202.5	1
10	80	1.5	225	1
10	80	1.5	247.5	1
10	80	1.5	270	1
10	80	1.5	292.5	1
10	80	1.5	315	1
10	80	1.5	337.5	1
10	80	1.5	0	4
10	80	1.5	22.5	4
10	80	1.5	45	4
10	80	1.5	67.5	4
10	80	1.5	90	4
10	80	1.5	112.5	4
10	80	1.5	135	4
10	80	1.5	157.5	4
10	80	1.5	180	4
10	80	1.5	202.5	4
10	80	1.5	225	4
10	80	1.5	247.5	4
10	80	1.5	270	4
10	80	1.5	292.5	4
10	80	1.5	315	4
10	80	1.5	337.5	4
10	80	2.25	0	-1.6
10	80	2.25	22.5	-1.6
10	80	2.25	45	-1.6
10	80	2.25	67.5	-1.6
10	80	2.25	90	-1.6
10	80	2.25	112.5	-1.6

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	2.25	135	-1.6
10	80	2.25	157.5	-1.6
10	80	2.25	180	-1.6
10	80	2.25	202.5	-1.6
10	80	2.25	225	-1.6
10	80	2.25	247.5	-1.6
10	80	2.25	270	-1.6
10	80	2.25	292.5	-1.6
10	80	2.25	315	-1.6
10	80	2.25	337.5	-1.6
10	80	2.25	0	1
10	80	2.25	22.5	1
10	80	2.25	45	1
10	80	2.25	67.5	1
10	80	2.25	90	1
10	80	2.25	112.5	1
10	80	2.25	135	1
10	80	2.25	157.5	1
10	80	2.25	180	1
10	80	2.25	202.5	1
10	80	2.25	225	1
10	80	2.25	247.5	1
10	80	2.25	270	1
10	80	2.25	292.5	1
10	80	2.25	315	1
10	80	2.25	337.5	1
10	80	2.25	0	4
10	80	2.25	22.5	4
10	80	2.25	45	4
10	80	2.25	67.5	4
10	80	2.25	90	4
10	80	2.25	112.5	4
10	80	2.25	135	4
10	80	2.25	157.5	4
10	80	2.25	180	4
10	80	2.25	202.5	4

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	2.25	225	4
10	80	2.25	247.5	4
10	80	2.25	270	4
10	80	2.25	292.5	4
10	80	2.25	315	4
10	80	2.25	337.5	4
10	80	3	0	-1.6
10	80	3	22.5	-1.6
10	80	3	45	-1.6
10	80	3	67.5	-1.6
10	80	3	90	-1.6
10	80	3	112.5	-1.6
10	80	3	135	-1.6
10	80	3	157.5	-1.6
10	80	3	180	-1.6
10	80	3	202.5	-1.6
10	80	3	225	-1.6
10	80	3	247.5	-1.6
10	80	3	270	-1.6
10	80	3	292.5	-1.6
10	80	3	315	-1.6
10	80	3	337.5	-1.6
10	80	3	0	1
10	80	3	22.5	1
10	80	3	45	1
10	80	3	67.5	1
10	80	3	90	1
10	80	3	112.5	1
10	80	3	135	1
10	80	3	157.5	1
10	80	3	180	1
10	80	3	202.5	1
10	80	3	225	1
10	80	3	247.5	1
10	80	3	270	1
10	80	3	292.5	1

Temperature ^{0}C	Humidity %	Wind Speed m/s	Wind Direction (degrees)	VTG ^{0}C/100m
10	80	3	315	1
10	80	3	337.5	1
10	80	3	0	4
10	80	3	22.5	4
10	80	3	45	4
10	80	3	67.5	4
10	80	3	90	4
10	80	3	112.5	4
10	80	3	135	4
10	80	3	157.5	4
10	80	3	180	4
10	80	3	202.5	4
10	80	3	225	4
10	80	3	247.5	4
10	80	3	270	4
10	80	3	292.5	4
10	80	3	315	4
10	80	3	337.5	4