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30 April 2020

Lauren Evans
Team Leader, Energy and Resource Assessments
NSW Department of Planning, Industry and Environment
GPO Box 39
Sydney NSW 2001

By email: Lauren.Evans@planning.nsw.gov.au

Dear Lauren,

RE: MAXWELL PROJECT (SSD-9526) – RESPONSE TO INFORMATION REQUEST

I refer to the Department of Planning, Industry and Environment's information request (dated 30 March 2020). The matters raised in the Department's information request are addressed in the enclosures to this letter, as summarised below.

Traffic and Transport

Supplementary modelling of the Thomas Mitchell Drive and Denman Road intersection has been undertaken by The Transport Planning Partnership (Enclosure 1). The updated modelling indicates that the intersection would continue to operate at a good Level of Service (LOS B), including with the addition of traffic from the Maxwell Project.

Malabar's contributions to the completed upgrade and ongoing maintenance of Thomas Mitchell Drive are discussed in response to the matters raised by Muswellbrook Shire Council (Enclosure 4).

Air Quality

A letter from Todoroski Air Sciences addressing the residual air quality matters raised in the Department's information request is provided in Enclosure 2.

The figures requested by the Department are also included in Enclosure 2.

Water Licensing

Supplementary information regarding water licensing, which has been prepared in response to the consolidated review from the Department of Planning, Industry and Environment – Water (DPIE – Water) and the NSW Natural Resources Regulator (NRAR) of the Submissions Report for the Maxwell Project (SSD 9526) (dated 5 February 2020), is provided in Enclosure 3.

Malabar contends that there is no basis for requiring the licencing of water inflow from the spoil. All water held within the limits of the former Drayton Mine ("pit shell") has already been accounted for under the provisions of the *Water Management Act, 2000*. The pit shell area is protected from external surface runoff through a combination of topography and flow diversion structures.

The additional information provided in Enclosure 3 supports the above position.

Matters Raised by Muswellbrook Shire Council

The Department received further email correspondence from Muswellbrook Shire Council (dated 25 March 2020) that requested additional information with respect to a number of residual matters relating to the Maxwell Project.

The Department has reviewed Muswellbrook Shire Council's correspondence and requested Malabar's response with respect to the:

a) Need for an adaptive biodiversity management plan with respect to subsidence impacts;
b) Establishment of a biodiversity corridor (including timing);
c) Realignment of Edderton Road; and
d) Terms of a potential Voluntary Planning Agreement (VPA) with respect to the Project.

Malabar's response to each of these residual matters is provided in Enclosure 4.

Please do not hesitate to contact the undersigned should you wish to discuss.

Yours sincerely,

Bill Dean
General Manager – Projects
Malabar Coal Limited

Enclosure 1 Response to Traffic and Transport Matters

Enclosure 2 Response to Air Quality Matters

Enclosure 3 Additional Water Licensing Information

Enclosure 4 Response to Matters Raised by Muswellbrook Shire Council

Enclosure 1
Response to Traffic and Transport Matters

Our Ref: 18136

27 April 2020

Malabar Coal Limited
c/- Resource Strategies Pty Ltd

Attention: Mr Bill Dean

Dear Bill,

RE: MAXWELL PROJECT
THOMAS MITCHELL DRIVE AND DENMAN ROAD

As requested, The Transport Planning Partnership (TTPP) has reviewed the assessment of the forecast operating conditions at the intersection of Thomas Mitchell Drive and Denman Road (the intersection) presented in the *Maxwell Project Road Transport Assessment* (TTPP, 2019a) and *Maxwell Project – Addendum to Road Transport Assessment* (TTPP, 2019b).

Background

Transport for NSW (TfNSW) has provided a supplementary submission regarding the predicted performance of the intersection. The Department of Planning, Industry and Environment (DPIE) has reviewed TfNSW's submission and noted that TTPP's 2019 assessment forecast poorer operating conditions than those presented in the *Thomas Mitchell Drive and Denman Road Traffic Study* (GHD, 2018) (GHD report). The DPIE has suggested that the variation between the two studies is due to the conservatism of the assumptions made in the TTPP assessment, and has requested that additional modelling of the intersection be undertaken to assess the following:

a) *for the 2020 scenario based on the most recent available data regarding the operational workforce at the Mt Arthur, Mount Pleasant and Bengalla Mines; and*

b) *for the 2026 scenario, assuming that the operational workforce at Mt Arthur remains at or below 1500.*

The critical timing for intersection performance is anticipated to occur during the PM peak conditions, noting that the TTPP (2019) assessments related to the peak hour for traffic generation of the Maxwell Project, being 5:00 pm to 6:00 pm (the PM peak hour). This review and additional modelling therefore do not reassess AM peak hour conditions. The critical

movement at the intersection during the PM peak hour is the right turn from Thomas Mitchell Drive, which is opposed by northbound and southbound through traffic on Denman Road, and those vehicles which turn right from Denman Road to Thomas Mitchell Drive.

Survey and Modelling Data

TTPP has replicated GHD's assumptions, based on the information provided in the GHD report. There are some minor geometric differences between the models which are not significant to the assessment outputs, nor are results expected to be notably impacted by the version of SIDRA used (GHD used SIDRA 7.0 and TTPP used SIDRA 8.0).

TTPP has also updated the assessment to use the baseline traffic data derived from the survey conducted by GHD in August 2018, and applying the Peak Flow Factor derived from the survey conducted by TTPP in June 2018 to robustly consider the observed variation in demands within the peak hour.

Operational Workforce Data

TTPP has reviewed publicly available information regarding the current and future workforces at the Mt Arthur, Mount Pleasant and Bengalla Mines. Our findings are outlined below, and compared with the assumptions made at the time of the 2019 assessments, together with implications for the forecast conditions at the intersection in 2020 and 2026.

Mt Arthur Mine

The TTPP assessment relied on the *Thomas Mitchell Drive Contributions Study* (GHD, 2015) to derive assumptions regarding the Mt Arthur Mine contribution to traffic at the time of the traffic surveys in 2018. The forecasts in the *Thomas Mitchell Drive Contributions Study* were derived from surveys conducted in September 2013, with reference to redistribution of traffic prepared by GTA Consultants[1] (2012), and assumed that the workforce at Mt Arthur would remain unchanged throughout the life of the mine.

Workforce data for Mt Arthur Mine indicates that the workforce has varied as below (total of permanent and fixed term contractors on full-time equivalent basis):

- mid-2013 – 2,242 workers[2];
- mid-2018 – 1,503 workers[3]; and

[1] GTA Consultants (2012), *Mt Arthur Coal Open Cut Modification Muswellbrook NSW Road Transport Assessment*.
[2] Mt Arthur Coal Annual Environmental Management Report FY13.
[3] Mt Arthur Annual Environmental Review FY18.

- mid-2019 – 1,915 workers[4].

The forecasts therefore assumed that the workforce would remain at around 2,240 people, and so do not take account of the reduction in workforce which has occurred since 2013. Therefore, in accordance with the request from the DPIE, TTPP has revised its assumptions as follows:

- at the time of the 2018 traffic surveys, the traffic generated of Mt Arthur Mine was 30 percent less than the original forecast derived from 2013 data;
- in 2020, the traffic generation of Mt Arthur Mine will be 15 percent less than the original forecast; and
- in 2026, the traffic generation of Mt Arthur Mine will be 30 percent less than the original forecast, i.e., the same as in 2018.

Mount Pleasant Operation

The TTPP assessment assumed that at the time of the traffic surveys in 2018, the Mount Pleasant Operation was working with the equivalent of its peak operational workforce of 380 full time equivalent workers employed. The future traffic forecasts therefore made no allowance for any additional traffic being generated by the Mount Pleasant Operation throughout its life above that already being generated in 2018.

Review of the Mount Pleasant Operation's operations summary[5] for 2018 indicates that throughout that year, a significant amount of construction activity occurred, while operational activity ramped up through the year. The production roster was modified in April 2018 to 12-hour day shifts, seven days per week.

Considering that both operational and construction activities were occurring at the time of the traffic surveys, the assumption that the traffic generated during the surveys was of a similar magnitude as that expected with ongoing operational activity is considered reasonable and has not been changed in this updated assessment.

Bengalla Mine

The TTPP assessment assumed that at the time of the traffic surveys in 2018, Bengalla Mine was producing approximately 10.75 Mtpa of ROM coal and employing approximately 720 people. The future traffic forecasts therefore included an allowance for traffic which would be generated by the additional 180 workers that would be present at Bengalla Mine at peak production, forecast to occur throughout the life of the mine after 2019.

[4] Mt Arthur Coal Annual Review FY19.
[5] *Mount Pleasant Operation – 2018 Annual Review,* MACH Energy Australia Pty Ltd.

The current workforce of approximately 800 people described on the Bengalla Mining Company's website[6] remains below the peak operational workforce of 900 people. The assumption that the traffic surveys conducted at the intersection in 2018 included the traffic generated by approximately 720 workers, with the potential for travel by an additional 180 workers at peak production appears reasonable. Accordingly, this assumption has not been changed in this assessment.

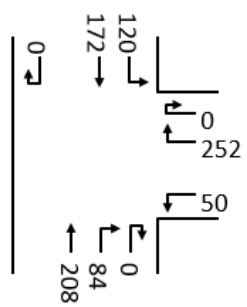
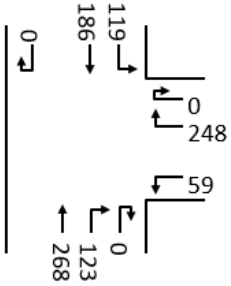
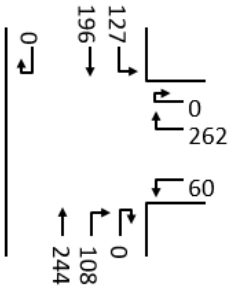
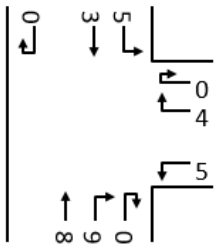
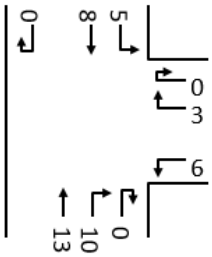
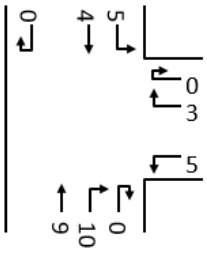
Updated Forecasts and Modelling

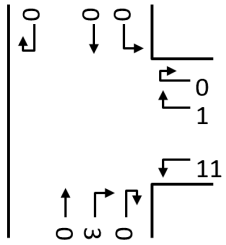
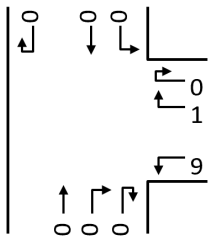
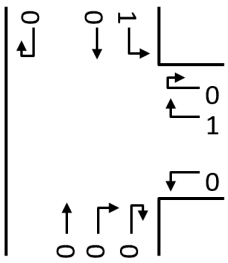
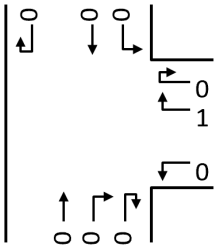
The revised assumptions regarding the Mt Arthur Mine were applied to the 2018 traffic volumes, using the same methodology as described in TTPP (2019) and briefly described below.

- 2018 survey includes Mt Arthur and Mount Pleasant traffic as above;
- 2020 forecast includes background growth, changes in Mt Arthur and Bengalla Mine traffic as above, Mangoola Coal Continuation Optimisation Project construction traffic, and Maxwell Solar Project traffic; and
- 2026 forecast includes background growth, changes in Mt Arthur and Bengalla Mine traffic as above, and Maxwell Solar Project traffic.

The resulting baseline peak hourly turning movements at the intersection are presented below, together with the turning movements expected to be generated by the Maxwell Project.

[6] https://www.bengalla.com.au/who-we-are/ viewed December 2019 and April 2020.

Surveyed GHD 2018 PM Peak Hour	2020 Baseline Forecast PM Peak Hour	2026 Baseline Forecast PM Peak Hour
Light Vehicles		
		
Heavy Vehicles		
		

2020 Maxwell Project Traffic PM Peak Hour	2026 Maxwell Project Traffic PM Peak Hour
Light Vehicles	
	
Heavy Vehicles	
	

The operation of the intersection has been reanalysed using SIDRA INTERSECTION 8, and the key operating characteristics are summarised in Table 1, applying the New South Wales level of service criteria (RTA, 2002).

Table 1: PM Peak Hour Intersection Operating Characteristics

Operating Characteristic (Critical Movement)	Surveyed	Baseline		With Maxwell Project	
	2018	2020	2026	2020	2026
Degree of Saturation	0.615	0.745	0.731	0.760	0.739
Average delay (seconds per vehicle)	19.1	27.0	24.9	28.0	25.4
Level of Service	B	B	B	B	B
95th Percentile Queue (metres)	30.3	40.7	40.7	42.7	41.9

Critical movement is the right turn from Thomas Mitchell Drive

The sensitivity of the results in Table 1 to the total vehicle demands with the Maxwell Project traffic have been reviewed using the SIDRA flow scale analysis. The Level of Service would remain within the acceptable range should demands on all movements be up to 106 percent of the 2020 forecast and 108 percent of the 2026 forecast with the Maxwell Project traffic.

Summary and Conclusion

TTPP has undertaken additional modelling of the intersection of Thomas Mitchell Drive with Denman Road incorporating the baseline traffic survey used by GHD together with the assumptions provided by the DPIE. Consistent with the outcomes of the *Thomas Mitchell Drive and Denman Road Traffic Study* (GHD, 2018), the updated modelling indicates the intersection would continue to operate at a good Level of Service (LOS B), including with the addition of traffic from the Maxwell Project.

We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on (02) 8437 7800.

Yours sincerely,

Penny Dalton
Associate Director

Attachment One

SIDRA INTERSECTION 8 Outputs

MOVEMENT SUMMARY

Site: 101 [GHD PM Peak 2018]

Denman Road and Thomas Mitchell Drive
Surveyed PM Peak Aug 2018
Replicates GHD layout and results PFF 0.95
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Thomas Mitchell Dr												
1	L2	58	9.1	0.055	7.9	LOS A	0.2	1.5	0.28	0.61	0.28	61.2
3	R2	269	1.6	0.548	16.9	LOS B	3.5	25.1	0.73	1.02	1.20	54.9
Approach		327	2.9	0.548	15.3	LOS B	3.5	25.1	0.65	0.95	1.03	55.9
East: Denman Rd N												
4	L2	132	4.0	0.073	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	64.0
5	T1	184	1.7	0.096	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		316	2.7	0.096	2.9	NA	0.0	0.0	0.00	0.26	0.00	72.4
West: Denman Rd S												
11	T1	227	3.7	0.180	0.8	LOS A	0.9	6.5	0.24	0.18	0.24	75.3
12	R2	98	9.7	0.180	8.9	LOS A	0.9	6.5	0.35	0.27	0.35	65.2
Approach		325	5.5	0.180	3.2	NA	0.9	6.5	0.27	0.20	0.27	72.0
All Vehicles		968	3.7	0.548	7.2	NA	3.5	25.1	0.31	0.47	0.44	65.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2018 PM Peak]

Denman Road and Thomas Mitchell Drive
Surveyed PM Peak August 2018
Peak Flow Time 30 min, PFF 0.90
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Thomas Mitchell Dr												
1	L2	61	9.1	0.058	8.0	LOS A	0.2	1.6	0.29	0.62	0.29	61.2
3	R2	284	1.6	0.615	19.1	LOS B	4.3	30.3	0.78	1.08	1.41	53.2
Approach		346	2.9	0.615	17.1	LOS B	4.3	30.3	0.69	1.00	1.21	54.4
East: Denman Rd N												
4	L2	139	4.0	0.077	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	64.0
5	T1	194	1.7	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		333	2.7	0.101	2.9	NA	0.0	0.0	0.00	0.26	0.00	72.4
West: Denman Rd S												
11	T1	240	3.7	0.186	0.8	LOS A	1.0	7.0	0.22	0.18	0.22	75.6
12	R2	114	8.7	0.186	8.8	LOS A	1.0	7.0	0.40	0.33	0.40	64.4
Approach		354	5.3	0.186	3.4	NA	1.0	7.0	0.27	0.22	0.27	71.6
All Vehicles		1033	3.7	0.615	7.8	NA	4.3	30.3	0.32	0.49	0.50	65.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2020 PM Peak]

Denman Road and Thomas Mitchell Drive
Revised 2020 PM Peak
Peak Flow Time 30 min, PFF 0.90
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Thomas Mitchell Dr												
1	L2	72	9.2	0.071	8.1	LOS A	0.3	1.9	0.32	0.63	0.32	61.0
3	R2	279	1.2	0.745	27.0	LOS B	5.8	40.7	0.88	1.22	2.00	47.8
Approach		351	2.8	0.745	23.1	LOS B	5.8	40.7	0.76	1.10	1.65	50.0
East: Denman Rd N												
4	L2	138	4.0	0.076	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	64.0
5	T1	216	4.1	0.114	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		353	4.1	0.114	2.7	NA	0.0	0.0	0.00	0.25	0.00	72.9
West: Denman Rd S												
11	T1	312	4.6	0.243	0.9	LOS A	1.3	9.7	0.23	0.18	0.23	75.4
12	R2	148	7.5	0.243	9.1	LOS A	1.3	9.7	0.43	0.34	0.43	64.6
Approach		460	5.6	0.243	3.5	NA	1.3	9.7	0.30	0.23	0.30	71.6
All Vehicles		1164	4.3	0.745	9.2	NA	5.8	40.7	0.35	0.50	0.62	63.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2020 PM Peak - with Maxwell Project]

Denman Road and Thomas Mitchell Drive
Revised 2020 PM Peak
Peak Flow Time 30 min, PFF 0.90
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Thomas Mitchell Dr												
1	L2	84	7.9	0.082	8.1	LOS A	0.3	2.2	0.32	0.63	0.32	61.4
3	R2	281	1.6	0.760	28.0	LOS B	6.0	42.7	0.89	1.24	2.08	47.1
Approach		366	3.0	0.760	23.4	LOS B	6.0	42.7	0.75	1.10	1.67	49.8
East: Denman Rd N												
4	L2	139	4.8	0.077	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	63.8
5	T1	216	4.1	0.114	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		354	4.4	0.114	2.8	NA	0.0	0.0	0.00	0.25	0.00	72.7
West: Denman Rd S												
11	T1	312	4.6	0.246	0.9	LOS A	1.3	9.9	0.23	0.18	0.23	75.4
12	R2	151	7.4	0.246	9.1	LOS A	1.3	9.9	0.44	0.34	0.44	64.6
Approach		463	5.5	0.246	3.6	NA	1.3	9.9	0.30	0.24	0.30	71.5
All Vehicles		1183	4.4	0.760	9.4	NA	6.0	42.7	0.35	0.50	0.63	63.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2026 PM Peak]

Denman Road and Thomas Mitchell Drive
Revised 2026 PM Peak
Peak Flow Time 30 min, PFF 0.90
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Thomas Mitchell Dr												
1	L2	72	7.7	0.070	8.1	LOS A	0.3	1.9	0.32	0.63	0.32	61.5
3	R2	294	1.1	0.731	24.9	LOS B	5.8	40.7	0.86	1.20	1.91	49.1
Approach		367	2.4	0.731	21.6	LOS B	5.8	40.7	0.75	1.09	1.60	51.1
East: Denman Rd N												
4	L2	147	3.8	0.081	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	64.1
5	T1	222	2.0	0.115	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		369	2.7	0.115	2.8	NA	0.0	0.0	0.00	0.25	0.00	72.8
West: Denman Rd S												
11	T1	281	3.6	0.220	0.9	LOS A	1.2	8.6	0.23	0.18	0.23	75.5
12	R2	131	8.5	0.220	9.1	LOS A	1.2	8.6	0.43	0.33	0.43	64.3
Approach		412	5.1	0.220	3.5	NA	1.2	8.6	0.29	0.23	0.29	71.5
All Vehicles		1148	3.5	0.731	9.1	NA	5.8	40.7	0.35	0.51	0.62	63.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2026 PM Peak - with Maxwell Project]

Denman Road and Thomas Mitchell Drive
Revised 2026 PM Peak
Peak Flow Time 30 min, PFF 0.90
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Thomas Mitchell Dr												
1	L2	82	6.8	0.080	8.1	LOS A	0.3	2.1	0.32	0.63	0.32	61.8
3	R2	297	1.5	0.739	25.4	LOS B	5.9	41.9	0.87	1.21	1.96	48.7
Approach		379	2.6	0.739	21.6	LOS B	5.9	41.9	0.75	1.08	1.60	51.1
East: Denman Rd N												
4	L2	147	3.8	0.081	7.0	LOS A	0.0	0.0	0.00	0.63	0.00	64.1
5	T1	222	2.0	0.115	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
Approach		369	2.7	0.115	2.8	NA	0.0	0.0	0.00	0.25	0.00	72.8
West: Denman Rd S												
11	T1	281	3.6	0.220	0.9	LOS A	1.2	8.6	0.23	0.18	0.23	75.5
12	R2	131	8.5	0.220	9.1	LOS A	1.2	8.6	0.43	0.33	0.43	64.3
Approach		412	5.1	0.220	3.5	NA	1.2	8.6	0.29	0.23	0.29	71.5
All Vehicles		1160	3.5	0.739	9.2	NA	5.9	41.9	0.35	0.52	0.63	63.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Enclosure 2
Response to Air Quality Matters

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17 April 2020

Bill Dean
Malabar Coal Limited
c/- Resource Strategies

RE: Maxwell Project – Air Quality and Greenhouse Gas Assessment – Request for Additional Information

Dear Bill,
The following outlines additional information and clarification to address the Department of Planning, Industry & Environment (DPIE) request for additional information relating to the *Maxwell Project Air Quality and Greenhouse Gas Assessment* (Air Quality Assessment) (**Todoroski Air Sciences, 2019**).

Each of the requests are shown in bullet points with grey italics and are followed by the response.

- *Given their geographical proximity, it is unclear why emissions from the Bengalla Mine were included in the air quality model (see Table 7-4) while emissions from the Mount Pleasant Mine (Mt Pleasant) were not.*
  Section 7.4.2 of Appendix J indicates that Mt Pleasant is sufficiently far away from the Project Area that 'its explicit inclusion in the model would not make any discernible contribution to dust levels at receptors near the Project'. This section also states that the residual level of dust due to non-modelled sources (such as Mt Pleasant) has been included in the cumulative results in Table 7-6. However, the background levels shown in Table 7-6 are based on monitoring data, from 2015, when Mt Pleasant was not yet operating. The Department requests further explanation/justification in this regard.

Section 7.4.2 of the Air Quality Assessment states: *"The residual level of dust would encompass the mining operations of; Mount Pleasant Operation, Mangoola Mine, Greater Ravensworth Area Operations and Muswellbrook Coal Mine, and other sources such as the Liddell and Bayswater Power Stations. These are located in positions or at distances from the Project, such that their individual explicit inclusion in the model would not make any discernible contribution to dust levels at receptors near the Project."*

This text was intended to convey that there are many dust sources each making small contributions at the nearest Project receptors and that individually these sources do not materially affect the Project results. Background levels are therefore used to account for the myriad of sources that are too distant or too small to warrant modelling individually (particularly broad scale agricultural activities). As there are many distant emission sources and each only makes a very small contribution to the background levels, the presence or

otherwise of any individual distant dust generating activity in an assessed year has no material influence on the assessment outcome relative to the influence of the nearfield sources.

This is supported by a review of the predictions for the Mount Pleasant Operation in Appendix G of the *Mount Pleasant Operation Mine Optimisation Modification Air Quality and Greenhouse Gas Assessment* (**Todoroski Air Sciences, 2017**), which demonstrates that the incremental contribution from the Mount Pleasant Operation during the maximum year modelled would be low for annual average $PM_{2.5}$ and PM_{10} at the receptors near the Project. This modelling is conservative and tends to show higher than actual results at more distant locations.

Whilst the Mount Pleasant Operation and Bengalla Mine are adjacent to each other, the majority of the dust emission sources emanating from the Bengalla Mine are materially closer to the Project than the majority of the dust emission sources emanating from the Mount Pleasant Operation. Furthermore, the Bengalla Mine more closely aligns with the prevailing wind axis towards the Project. The Bengalla Mine would therefore have a noticeable contribution at the receptors nearest to the Project, hence it was explicitly included in the dispersion modelling. To demonstrate the contribution from both the Bengalla Mine (as modelled in the Air Quality Assessment) and the Mount Pleasant Operation (as modelled for the *Mount Pleasant Operation Mine Optimisation Modification Air Quality and Greenhouse Gas Assessment* [**Todoroski Air Sciences, 2017**]), the incremental modelling predictions at a range of privately-owned receptors located near the Project are summarised in **Table 1**.

The modelled annual average $PM_{2.5}$ contribution from the Bengalla Mine is 0.2 to 0.3µg/m^3 compared to 0.05 to 0.08µg/m^3 from the Mount Pleasant Operation. The annual average PM_{10} contribution from the Bengalla Mine is 2.4 to 3.1µg/m^3 compared to 0.3 to 0.4µg/m^3 from the Mount Pleasant Operation. Therefore, due to the lower contributions emanating from the Mount Pleasant Operation together with a distance of 12km to the Project, the effects did not require modelling.

Table 1: Predicted incremental modelling results for receptors near the Project due to Bengalla and Mount Pleasant Operation

Receptor ID	Bengalla - Scenario 3 [1]		Mount Pleasant Operation - Year 2025 [2]	
	Ann. Ave. $PM_{2.5}$	Ann. Ave. PM_{10}	Ann. Ave. $PM_{2.5}$	Ann. Ave. PM_{10}
389	0.3	3.1	0.08	0.4
390	0.3	3.0	0.08	0.4
403	0.2	2.7	0.07	0.3
410	0.2	2.4	0.05	0.3

[1] Todoroski Air Sciences (2019) [2] Todoroski Air Sciences (2017)

The potential cumulative interaction of short-term contributions to dust levels were also considered. The Mount Pleasant Operation is positioned to the northwest of the nearest receptors and the Project is located to the south and southwest of the same receptors. Any contribution to short-term 24-hour average impacts from the Mount Pleasant Operation at the nearest receptors to the Maxwell Project are therefore unlikely to occur concurrently with contributions from the Project.

In other words, on a day when the nearest receivers are predominantly downwind of the Project (e.g. when winds are from the south or southwest), they would not also be downwind of the Mount Pleasant Operation. The likelihood of cumulative short-term 24-hour average impacts with the Mount Pleasant Operation occurring is therefore low and thus does not warrant explicit modelling.

- *Please clarify how emissions for the Mt Arthur Complex have been calculated. The Department notes that estimated emissions for the Complex (as shown in Table 7-4) range from approximately 16-17*

million kilograms of total suspended particulate matter (kg of TSP). Section 7.4.2 also indicates that these are conservative predictions, based on maximum extraction rates in the respect environmental assessments for each Project. However, the Air Quality and Greenhouse Gas Assessment for MP 09_0062 – Modification 1 (dated January 2013) estimated that maximum emissions from the modified project over the various modelled scenarios would range from approximately 22 to 28 million kg of TSP.

A brief explanation for this apparent discrepancy is set out below Table 7.4 of the Air Quality Assessment: *"The emission estimates for the Mt Arthur Mine were adjusted to account for the different meteorological conditions in this assessment compared with the conditions applied in Mt Arthur Mine's assessment (**PAEHolmes, 2013**). The methodology applied to do this is identical to the methodology applied in the Cumulative Impact Assessment Mt Arthur, Bengalla and Mangoola Coal Mines (**Todoroski Air Sciences, 2014**)."* A more detailed explanation of this is set out below.

The emission estimation equations for many sources of dust at mine sites include a factor to account for the effects of the wind acting on the source. These equations relate to the wind sensitive sources, and include wind erosion and activities such as the loading and emplacing of material. When material falls through the air, there will be more dust if there is higher wind speed.

It is noted that the same issue regarding the large difference between the emissions rates in the *Cumulative Impact Assessment Mt Arthur, Bengalla and Mangoola Coal Mines* (**Todoroski Air Sciences, 2014**) and the Mt Arthur assessment (**PAEHolmes, 2013**) was also raised at the time of the Todoroski Air Sciences, 2014 report. The issue arose because the assessment conducted by PAEHolmes in 2013 used meteorological data collected from a station on a hill, which recorded excessively high wind speeds that did not represent the actual wind conditions at the sources of dust at the Mt Arthur mine. Using wind speeds corresponding to those experienced at the sources has been shown to produce more accurate results.

For the Cumulative Impact Assessment for the Mt Arthur, Bengalla and Mangoola Coal Mines (**Todoroski Air Sciences, 2014**), where the same approach was used, it was confirmed that the modelled results correlated exceptionally well with the actual measured air quality data, verifying that using the most representative wind speed data in the emissions inventory calculations is important and is necessary for an accurate assessment.

In summary, the emissions from the Mt Arthur Coal Mine used in the Air Quality Assessment were calculated by varying a subset of the site's emission sources, which are wind-sensitive. A more representative (lower) windspeed was used to modify the emissions calculated in 2013, consistent with the methodology implemented in a previous assessment (**Todoroski Air Sciences, 2014**), which was commissioned by the Department of Planning and Infrastructure. The adopted methodology correlates exceptionally well with actual measured air quality data.

- *Table 7-4 also indicates that the model incorporates emissions from 'Hunter Valley Operations (Open Cut)'. However, it appears that these emissions relate to Hunter Valley Operations – North only. The Department requests confirmation in this regard.*

The dust emission estimate from Hunter Valley Operations included in the cumulative modelling for the Project was for Hunter Valley Operations North. The Hunter Valley Operations South are sufficiently far away, at a similar distance from the Project as the Mount Pleasant Operation, such that any contribution from this operation is likely to be negligible at the nearest receptor locations to the Project.

- *Please provide high-resolution versions of Figures E-21, E-23, E-24 and E-26 from Appendix J of the EIS. Please include receiver numbers for the receivers closest to the Maxwell Underground and Maxwell Infrastructure sites on these figures.*

Please see below higher-resolution versions of Figures E-21, E-23, E-24 and E-26 from Appendix J of the Air Quality Assessment.

Due to the large number of clustered receptors, it is not practical to clearly show the receiver numbers on even these high resolution figures.

However, review of Figures E-21, E-23, E-24 and E-26 indicates that contours are only close to privately-owned receptors on Figures E-21 and E-24, in the area to the north-east of the Maxwell Infrastructure. As such, please refer to "zoomed in" versions of these figures, showing the individual receptor numbers, presented as **Figure 1** (i.e. E-21) and **Figure 2** (i.e. E-24) below.

Note that the contour lines cannot be as precise as the specific predictions for each receptor. For the exact dispersion modelling predictions at each individual receiver, please be sure to refer to the modelling prediction tables presented in Appendix D of the Air Quality Assessment.

Please feel free to contact us if you would like to clarify any aspect of this letter.

Yours faithfully,
Todoroski Air Sciences

Philip Henschke

References

PAEHolmes (2013)

"Air Quality and Greenhouse Gas Assessment Mt Arthur Coal Open Cut Modification", prepared by PAEHolmes for Hunter Valley Energy Coal Pty Ltd, January 2013.

Todoroski Air Sciences (2014)

"Cumulative Impact Assessments Mt Arthur, Bengalla and Mangoola Coal Mines", prepared by Todoroski Air Sciences for NSW Department of Planning and Infrastructure, January 2014.

Todoroski Air Sciences (2017)

"Mount Pleasant Operation Mine Optimisation Modification Air Quality and Greenhouse GAS Assessment", prepared for MACH Energy Australia by Todoroski Air Sciences, May 2017.

Todoroski Air Sciences (2019)

"Maxwell Project Air Quality and Greenhouse Gas Assessment", prepared for Malabar Coal Limited by Todoroski Air Sciences, July 2019.

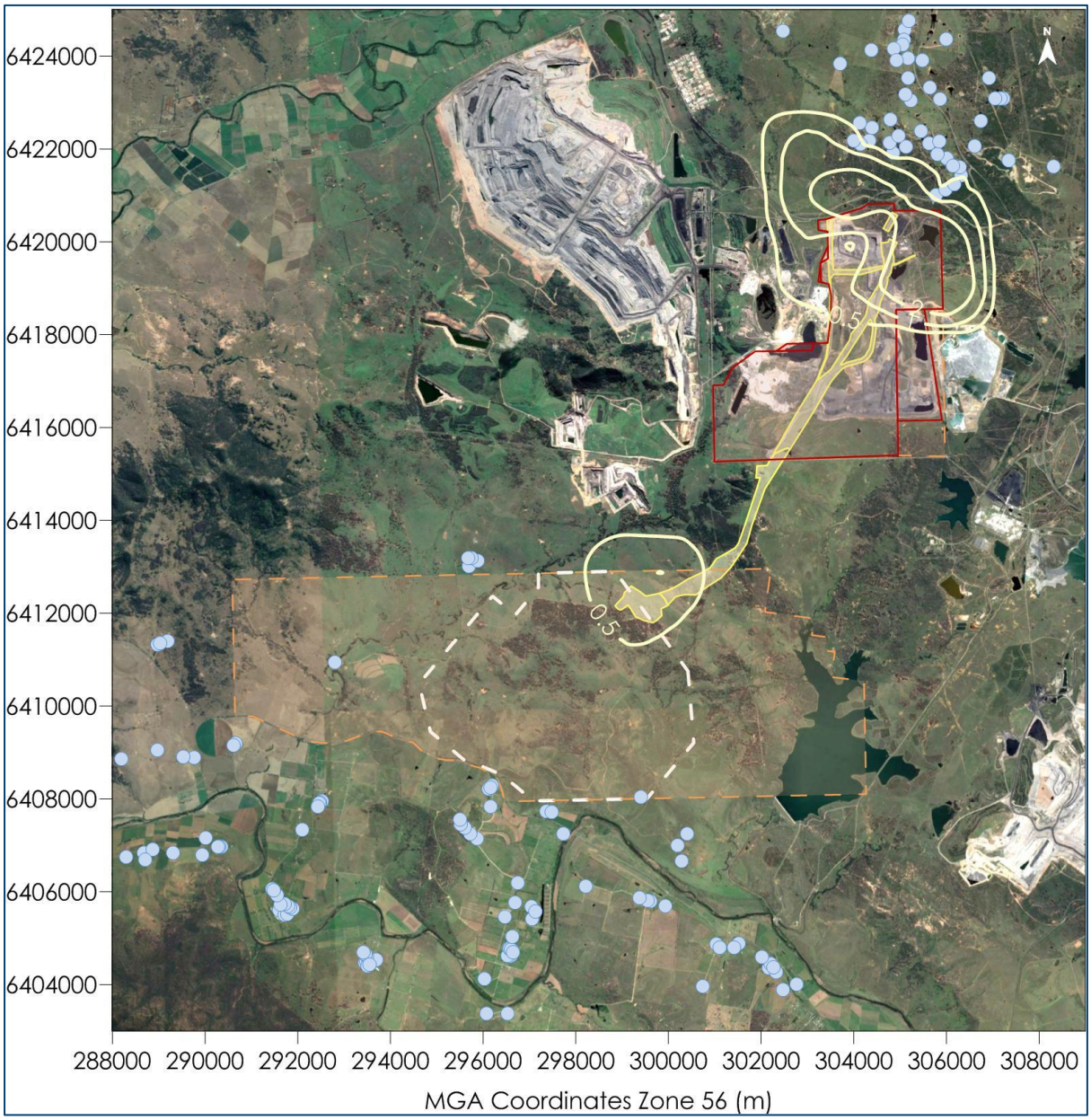

Figure E-21: Predicted maximum 24-hour average $PM_{2.5}$ concentrations due to emissions from the Project in Scenario 3 (µg/m^3)

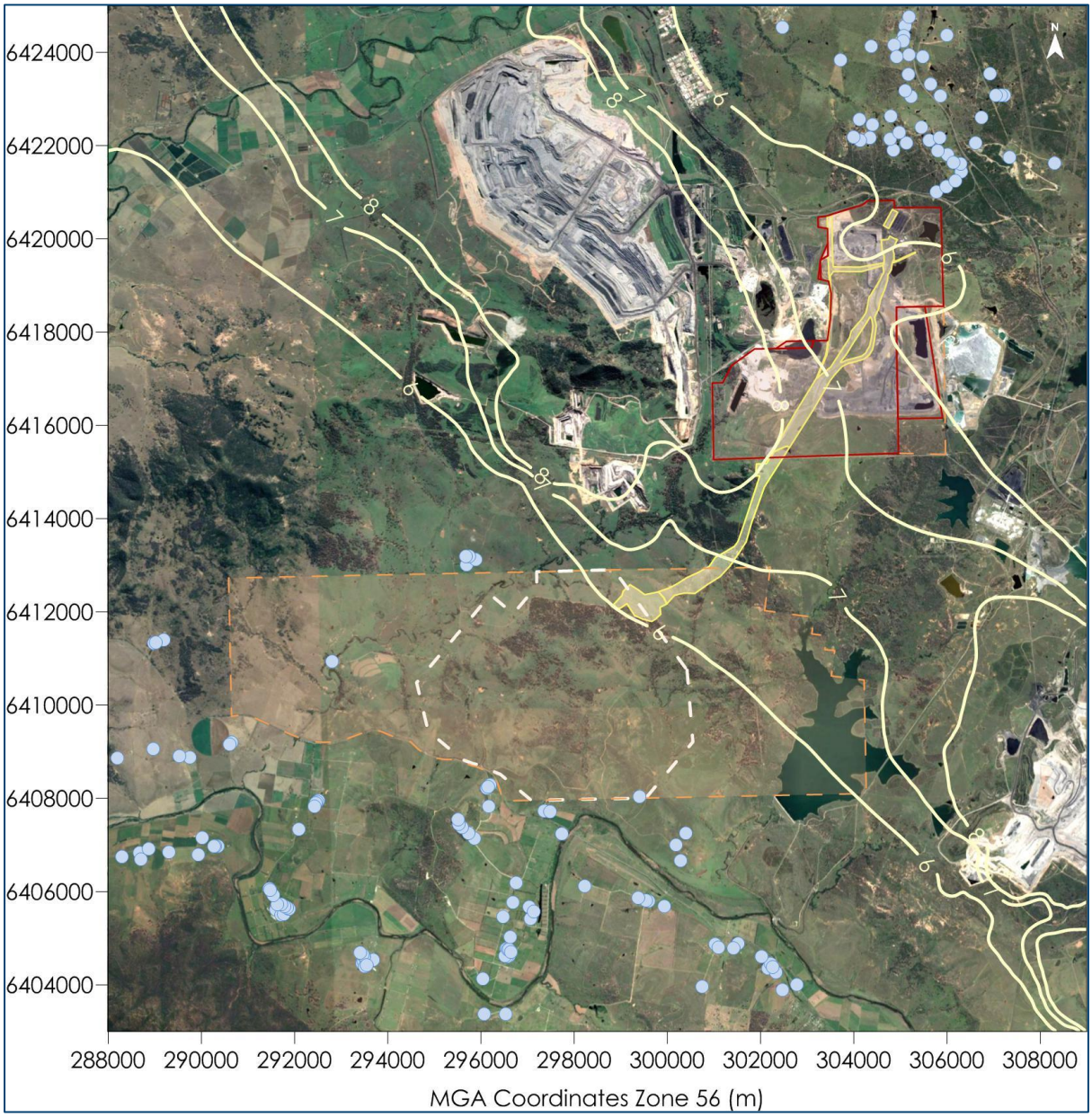

Figure E-23: Predicted annual average $PM_{2.5}$ concentrations due to emissions from the Project and other sources in Scenario 3 (µg/m^3)

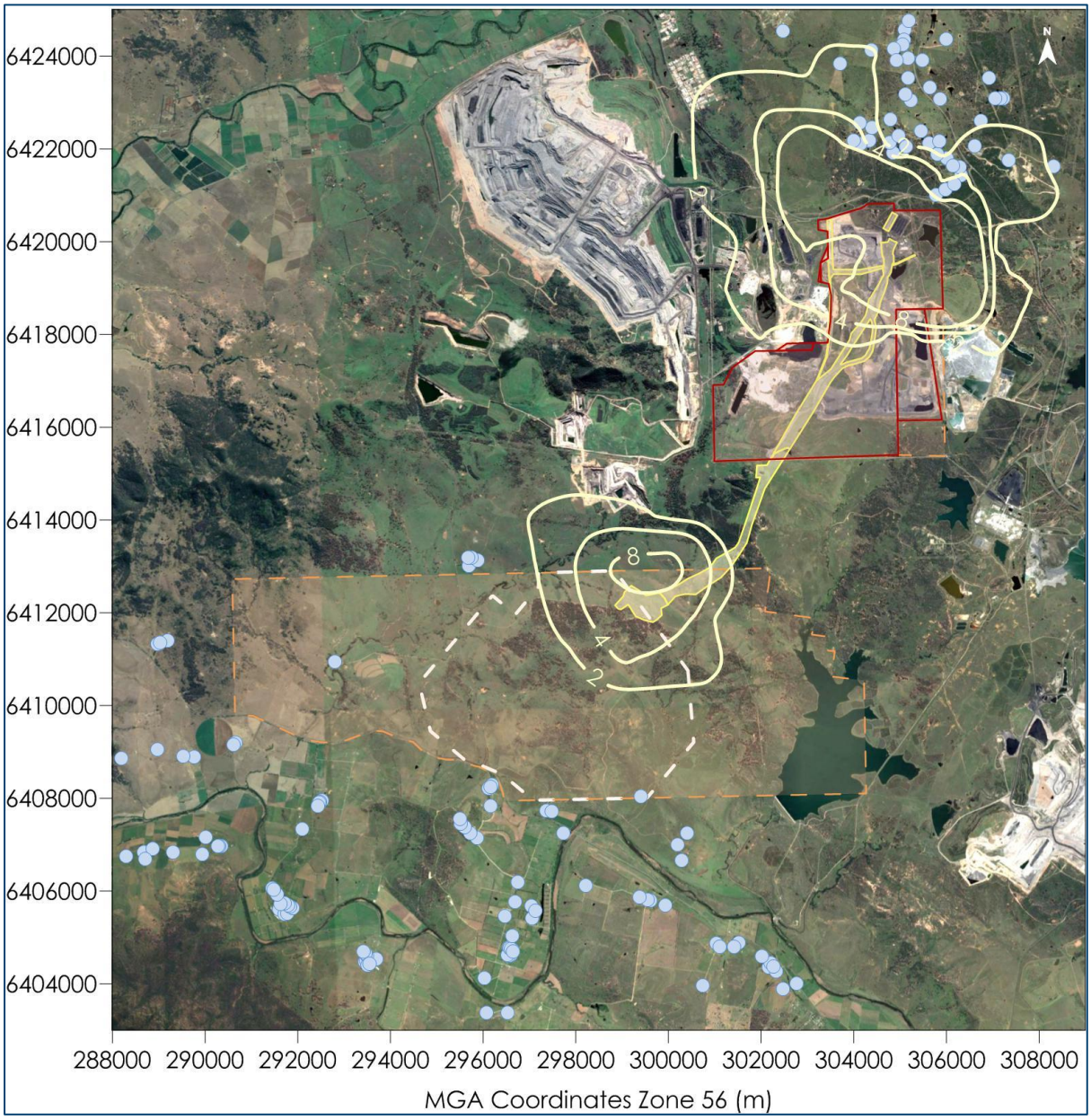

Figure E-24: Predicted maximum 24-hour average PM_{10} concentrations due to emissions from the Project in Scenario 3 (µg/m^3)

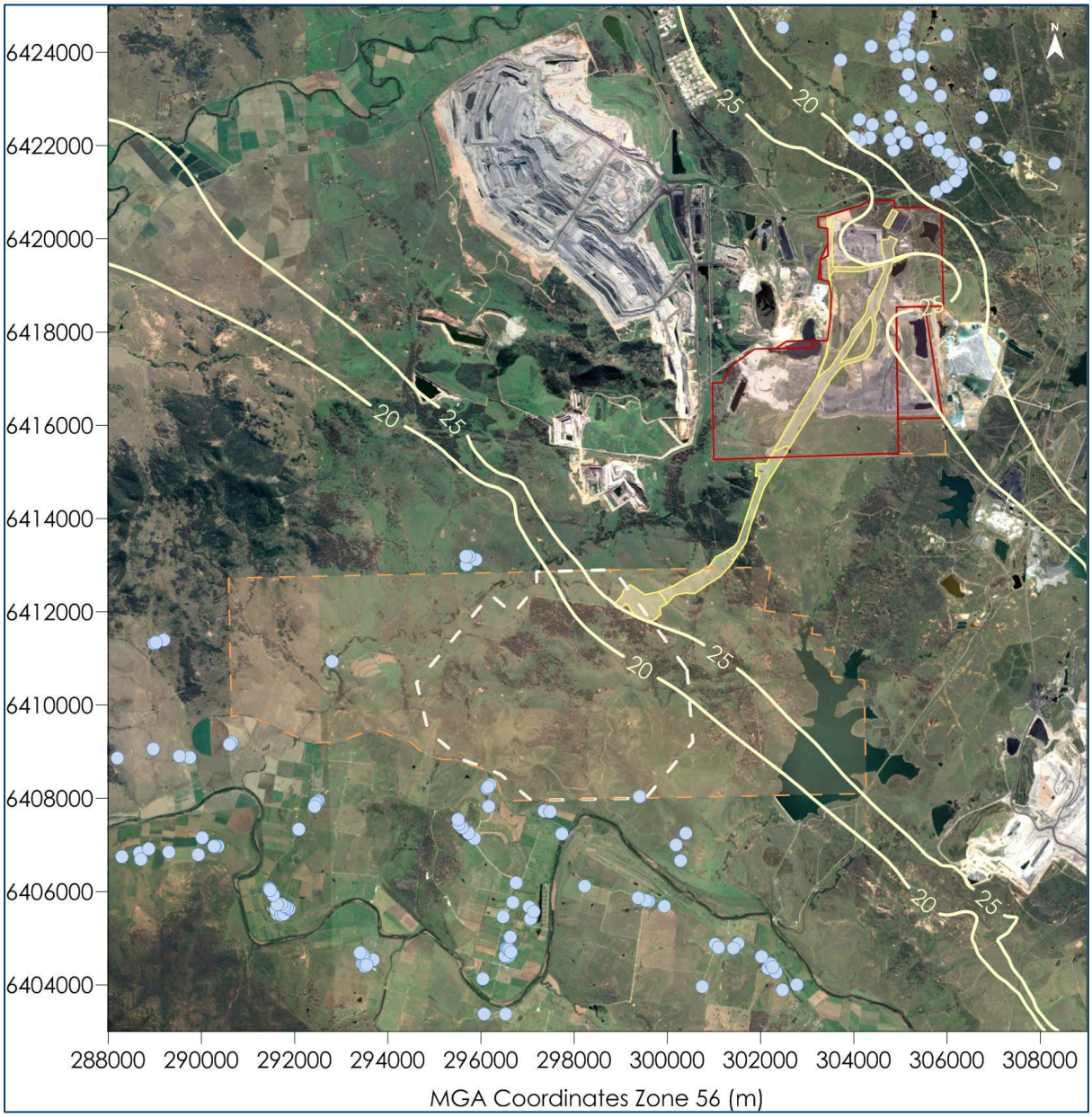

Figure E-26: Predicted annual average PM_{10} concentrations due to emissions from the Project and other sources in Scenario 3 (µg/m^3)

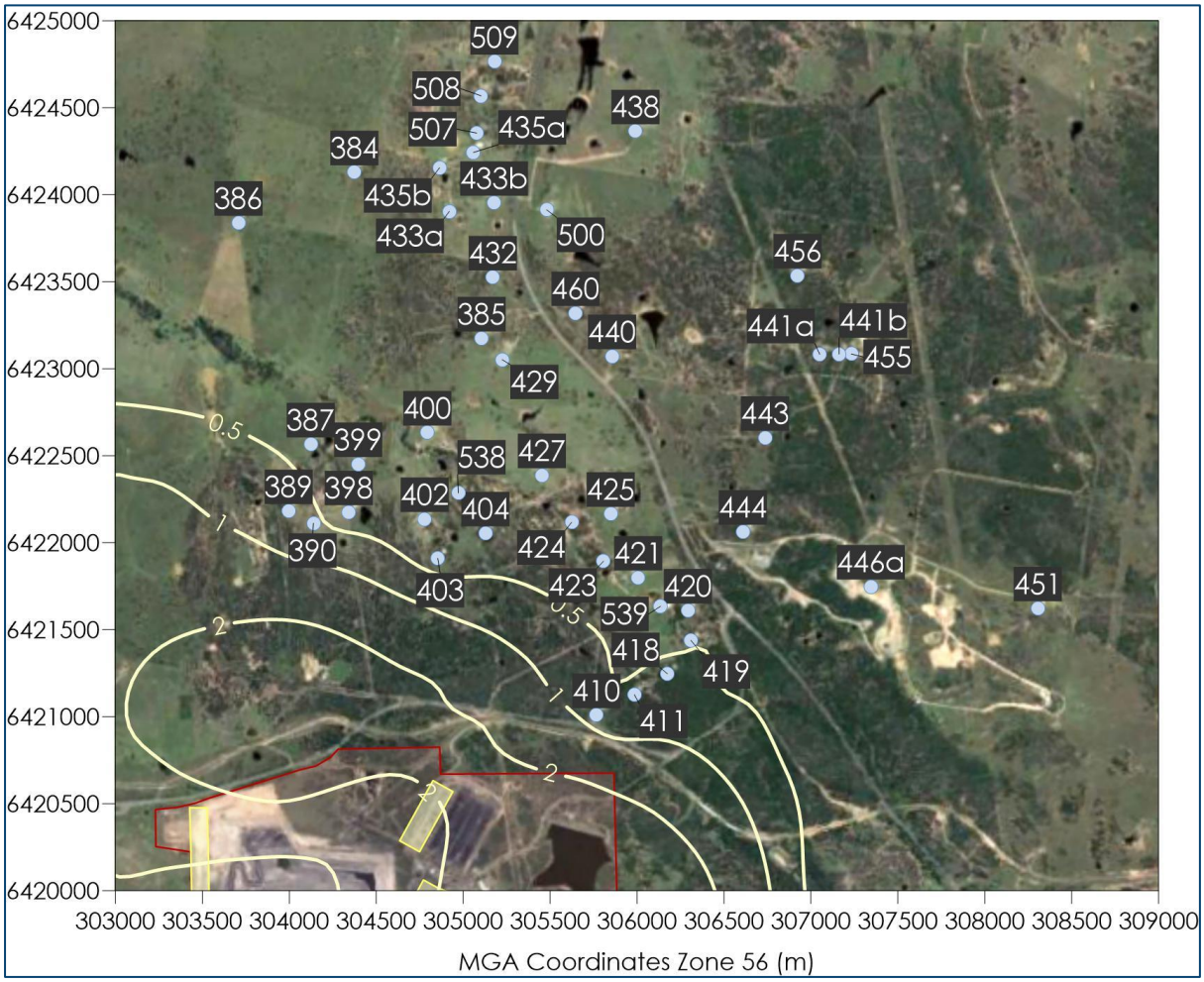

Figure 1: Predicted maximum 24-hour average $PM_{2.5}$ concentrations due to emissions from the Project in Scenario 3 (µg/m³)

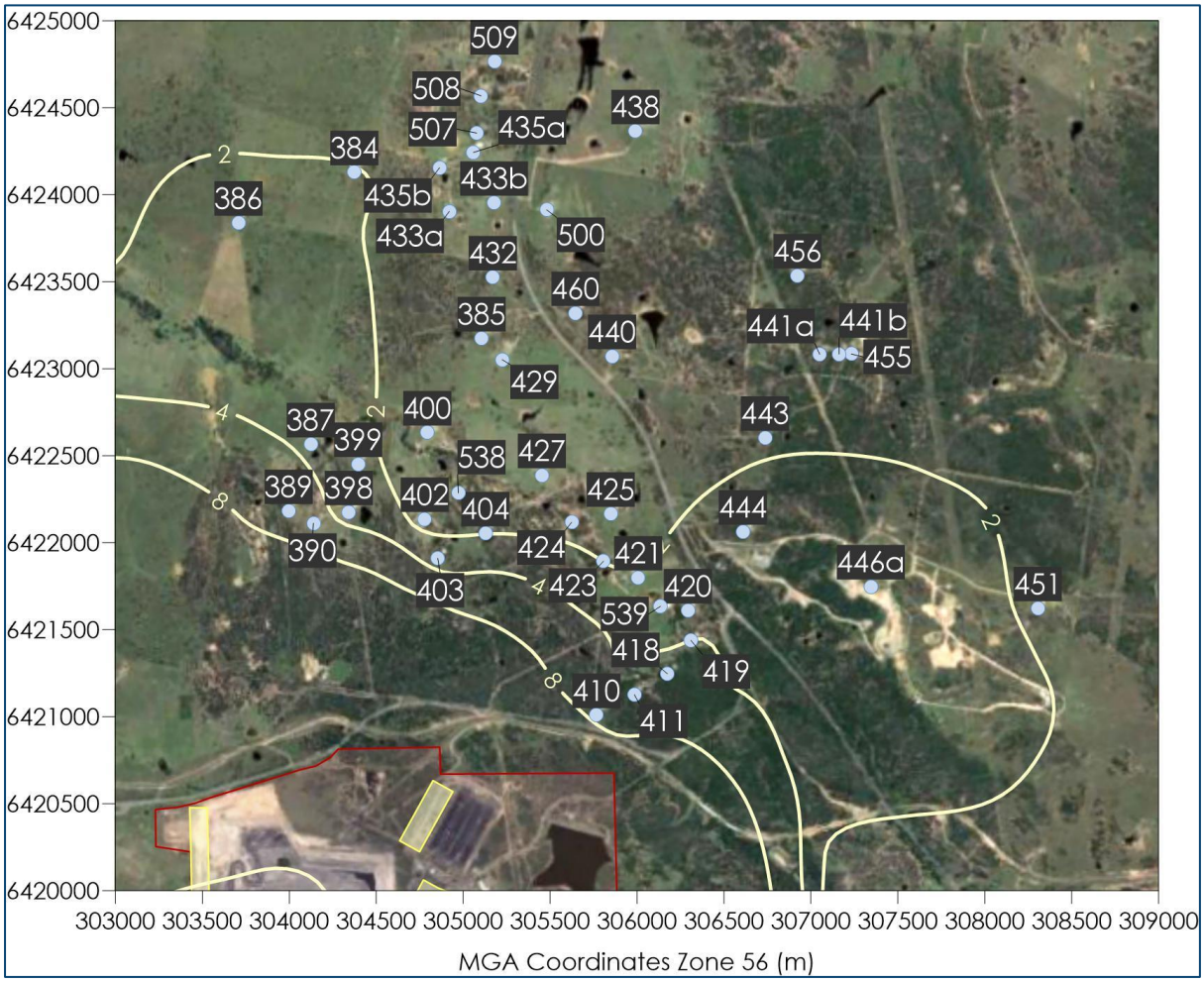

Figure 2: Predicted maximum 24-hour average PM_{10} concentrations due to emissions from the Project in Scenario 3 (µg/m³)

Enclosure 3
Additional Water Licensing Information

28 April 2020

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Lauren Evans
Team Leader, Energy and Resource Assessments
NSW Department of Planning, Industry and Environment
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Sydney NSW 2001

By email: Lauren.Evans@planning.nsw.gov.au

Dear Lauren,

RE: RESPONSE TO DPIE – WATER AND NRAR COMMENTS ON THE MAXWELL PROJECT (SSD-9526) SUBMISSIONS REPORT

I refer to the consolidated review from the Department of Planning, Industry and Environment – Water (DPIE – Water) and the NSW Natural Resources Regulator (NRAR) of the Submissions Report for the Maxwell Project (SSD 9526) (dated 5 February 2020). Malabar considers that the residual comments can be addressed through the requirements of the *Water Management Act 2000* and a condition requiring a Water Management Plan under the Development Consent.

Notwithstanding, some additional points of clarification are provided below.

The 5 February submission raised the following issue:

> *DPIE Water and NRAR hold the position that water inflow to the existing voids at former Drayton Mine from the spoil is required to be licenced under the Water Management Act, 2000 (i.e. approximately 2,200 ML/year [6.1 ML/day]).*

Malabar contends that there is no basis for requiring the licencing of water inflow from the spoil. All water held within the limits of the former Drayton Mine ("pit shell") has already been accounted for under the provisions of the *Water Management Act, 2000*. The pit shell area is protected from external surface runoff through a combination of topography and flow diversion structures.

The following additional information is provided support the above position.

1. Final Void Water Storage

Open cut mining was undertaken at the former Drayton Mine (now known as the Maxwell Infrastructure) for more than 30 years. All seams to the base of the mining sequence within the pit shell were mined.

To improve environmental outcomes and facilitate efficient mining operations, spoil was progressively backfilled into the pit shell rather than leaving a large (approximately 800 hectares) void and large out-of-pit waste emplacement.

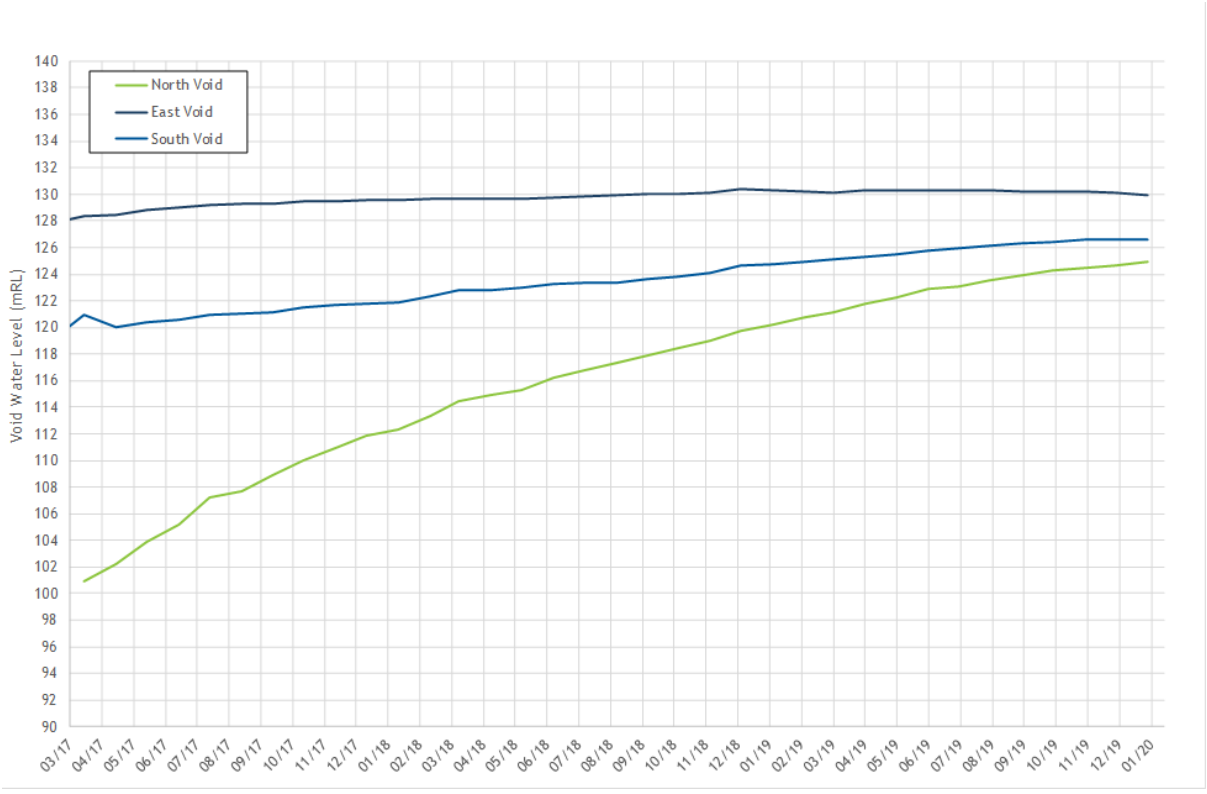
Consistent with Project Approval 06_0202, the existing landform at the Maxwell Infrastructure includes three open voids (Figure 1). The three open voids share a common floor and are not isolated water storages but are hydraulically interconnected by highly porous backfilled waste rock (spoil). Relevantly, the Project would involve the partial backfilling of the East Void with reject material from the Coal Handling and Preparation Plant (CHPP).

Over time, water levels in the open voids would increase (from rainfall, external groundwater inflows and water pumped from the Maxwell Underground). As the water level increases, the rate of seepage from the in-pit spoil would decrease in accordance with Darcy's Law (Figure 2).

This is supported by monitored void water levels from 2017 to 2019 (Chart 1). Groundwater inflows into the East and South Voids are reducing as the East and South Voids approach equilibrium. The North Void, which was an operating pit until October 2016, is also reaching equilibrium as the difference in head between the void water level and the surrounding groundwater table diminishes.

Analysis by HydroSimulations (2019) indicates that external groundwater inflows into the voids at the Maxwell Infrastructure would be negligible over the life of the Project. Rather, the open voids would typically lose water to the surrounding spoil until it re-saturates. Water would flow to the open voids when the hydraulic gradient (i.e. head) in the spoil is greater than the water level in these voids, and vice versa (WRM Water and Environment [WRM], 2019). This is further explained in Section 2 below.

Chart 1
Monitored Void Water Levels



LEGEND
- Railway
- Exploration Licence Boundary
- Mining and Coal Lease Boundary
- Indicative Cross-section Location

Source: NSW Spatial Services (2019)
Orthophoto Mosaic: 2018, 2016, 2011

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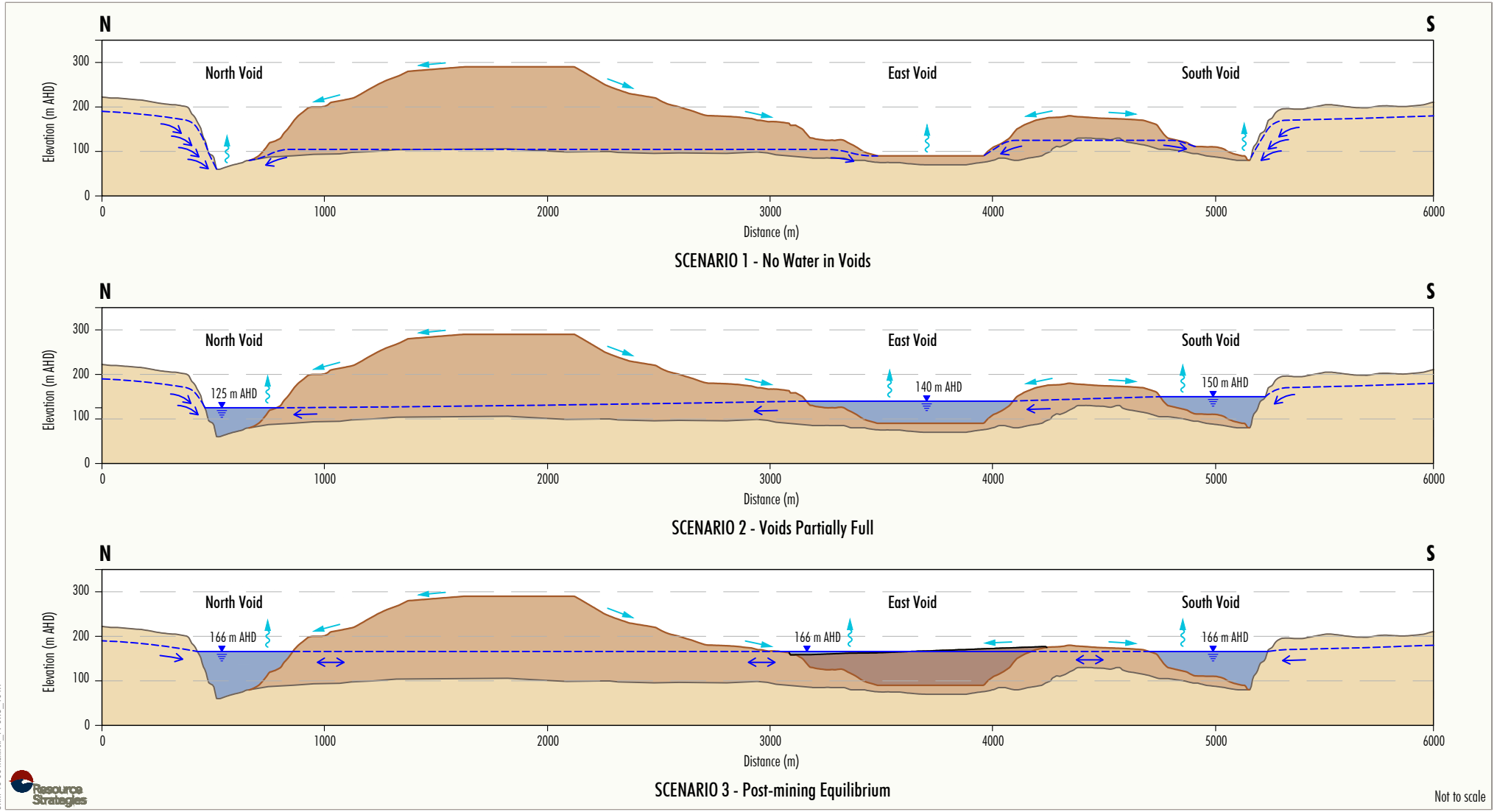
MAXWELL PROJECT

Maxwell Infrastructure - Voids

Figure 1



LEGEND

- In-situ Hard Rock
- Backfilled Waste Rock (Spoil)
- Proposed CHPP Reject Emplacement
- Indicative Water Table
- Groundwater Flow Direction
- Surface Water Runoff
- Evaporation

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MAXWELL PROJECT

Maxwell Infrastructure
- Conceptual Cross-section

Figure 2

2. Recent Void Inflow Rates

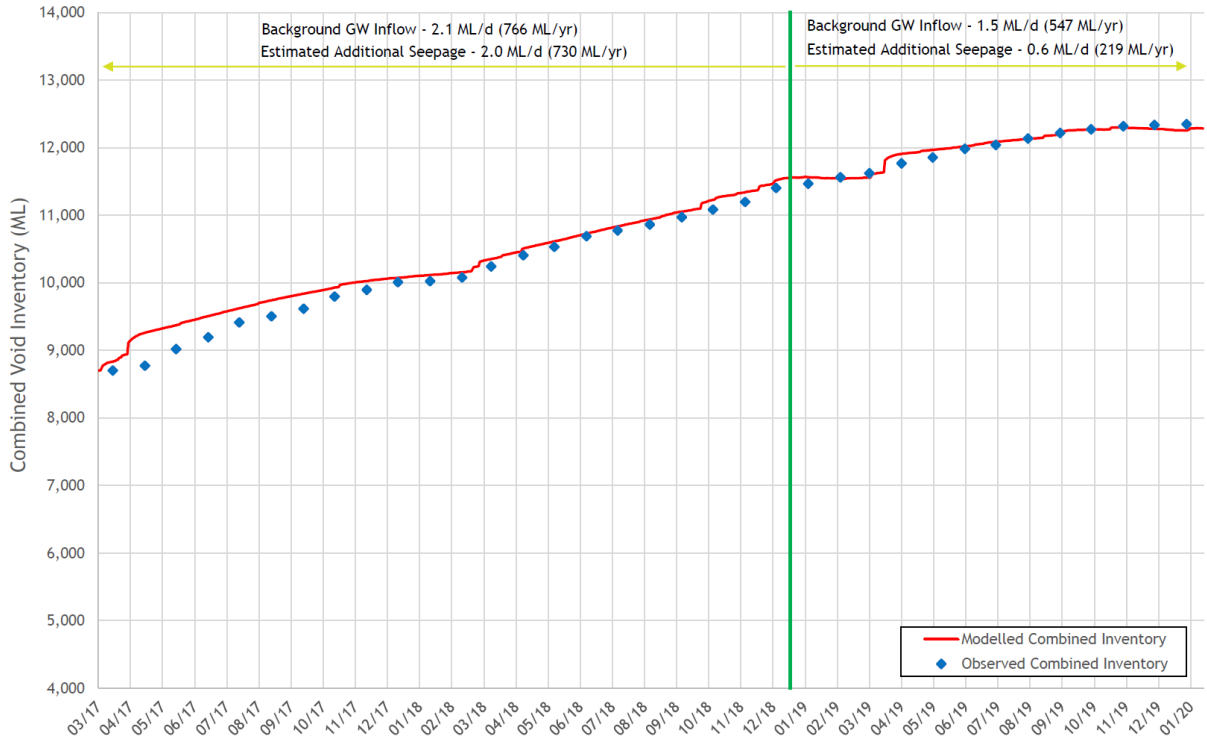
As part of the calibration of the site water balance model, WRM identified an inflow to the voids of approximately 6.1 megalitres per day (ML/day) additional to contributions from rainfall and runoff. HydroSimulations (2019) determined that the source of the additional inflow was seepage from the in-pit spoil, along with external groundwater inflows (WRM, 2019).

Malabar has updated the void water volume database, including correcting an issue with the interpretation of the surveyed measurements that was resulting in the overestimation of water held in the voids[1]. WRM has used the corrected database to revise the site water balance calibration (Chart 2), which demonstrates:

- A total inflow rate in 2017/2018 of 4.1 ML/day.
- A reduction in total inflow rate in 2019 to 2.1 ML/day.

Future external groundwater inflow rates will be less as the water level in the voids becomes closer to the surrounding groundwater level (HydroSimulations, 2019).

Chart 2
Updated Site Water Balance Model Calibration



[1] The previous void water volumes for a number of measured water levels were incorrectly interpreted. This skewed the previous calibration as it showed the water level increasing at a faster rate than what occurred in practice.

3. Groundwater Sources

The DPIE – Water and NRAR review states:

> *Malabar currently holds 527 units of Water Access Licenses (WAL) in the Sydney Basin-North Groundwater Source associated with WALs 41491 and 41559.*

Malabar notes that Water Access Licences (WALs) 41491 and 41559 also include 860 units of WAL entitlement in the New England Fold Belt Groundwater Source.

The majority of the existing voids at the Maxwell Infrastructure are located in the New England Fold Belt Coast, consistent with Malabar's licence entitlement in that source (Figure 3). Therefore, any take of water assigned to the existing voids should be assigned to both sources proportionately.

WAL 41491 and WAL 41559 were converted from 20BL111869/20BL122620, which were issued to account for the maximum predicted groundwater take associated with the former Drayton Mine (i.e. when the pits were operational and actively dewatered). As discussed above, external groundwater inflows will reduce as the water levels rise within the pit shell and existing voids.

4. Water Licensing Considerations

The DPIE – Water and NRAR review states:

> *For the purposes of the Water Management Act 2000, water stored within mine spoil is groundwater and water that flows to the pit void is licensable take.*

Malabar's view (supported by its experts) is that water that flows back and forth between the spoil and the voids should not need to be licensed, given:

- Water stored within the pit shell flows within a closed system; flowing back and forth between the voids and the highly permeable backfilled spoil material as the water level in the pit shell fluctuates (due to; groundwater inflow, rainfall, evaporation, and pumping activities).
- All groundwater that has previously flowed into this pit shell has already been licensed separately.
- Water that continues to flow from external groundwater sources to the pit shell will continue to be licensed.
- Groundwater inflows to the Maxwell Underground would be pumped to the existing voids (Figure 4). Groundwater inflows to the Maxwell Underground would be licensed separately.

As all water currently held within the Drayton pit shell has been accounted for under the *Water Management Act, 2000* and therefore any proposed licensing of spoil inflows would not be appropriate as it would be "double counting". Notwithstanding, Malabar notes that the total current inflow to the existing voids at the Maxwell Infrastructure is 2.1 ML/day (766 ML/year), which is well within the existing entitlement associated with WAL 41491 and WAL 41559 (1,387 units).

Future groundwater inflow rates will be lower as the water level in the pit shell approaches the surrounding groundwater level (HydroSimulations, 2019). Accordingly, a portion of the licences currently required for the existing voids at the Maxwell Infrastructure would become available for use at the Maxwell Underground.

SHA-18-03 Maxwell_FV GWS_202B

LEGEND
Railway
Exploration Licence Boundary
Mining and Coal Lease Boundary

Source: NSW Spatial Services (2019)
Orthophoto Mosaic: 2018, 2016, 2011

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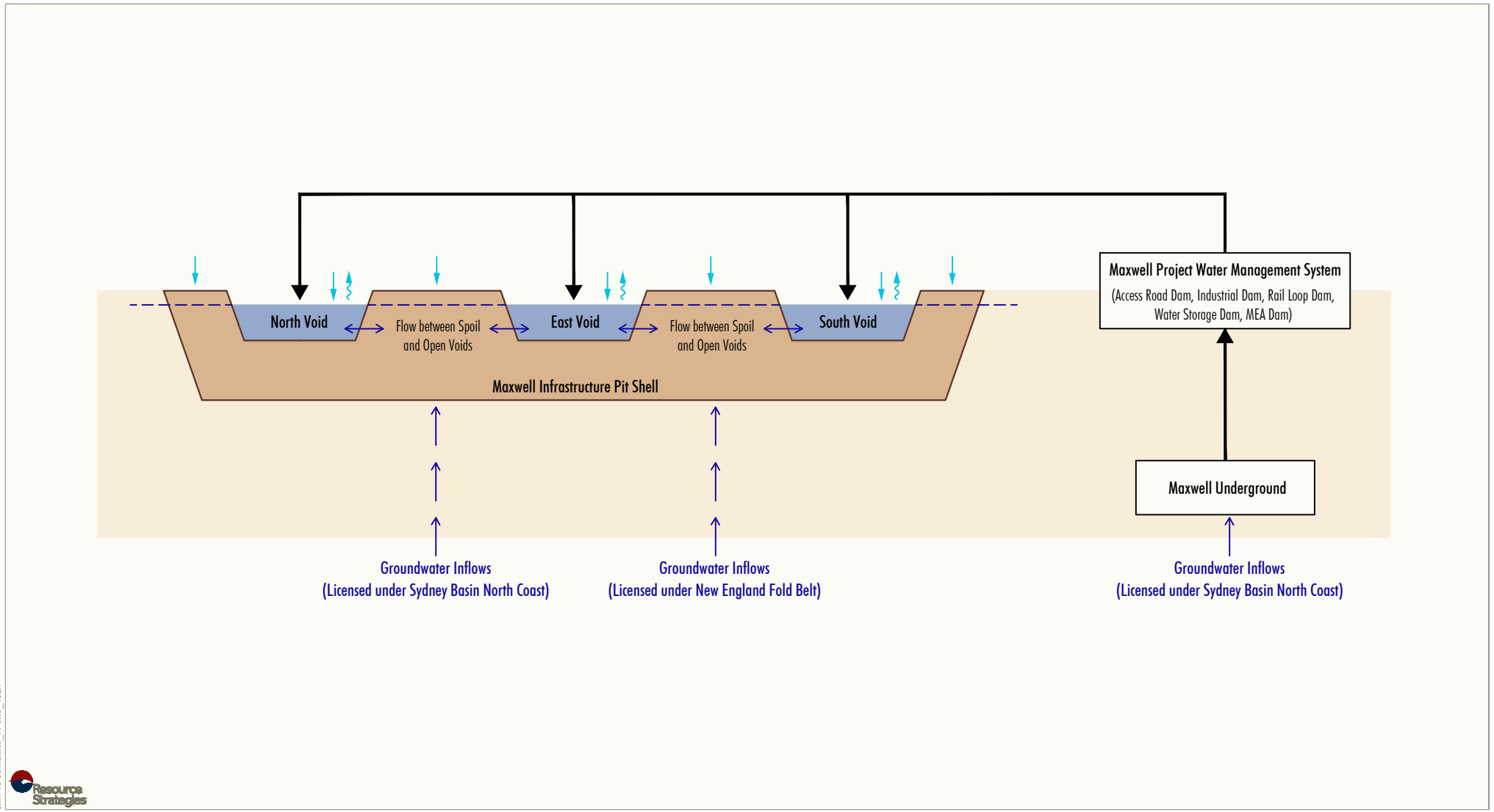
MAXWELL PROJECT

Maxwell Infrastructure
- Groundwater Sources

Figure 3



SHM-18-03 Maxwell_FV GWS_102A

Resource Strategies

LEGEND

- Pumped Transfer
- Indicative Water Table
- Groundwater Flow Direction
- Direct Rainfall and Catchment Runoff
- Evaporation

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MAXWELL PROJECT

Conceptual Void Water Circuit

Figure 4

Notwithstanding, Malabar has demonstrated that the ongoing acquisition of licences within the Sydney Basin-North Coast Groundwater Source is viable. Malabar has reached agreement for the transfer of 132 units as at 24 April 2020 (cf. 64 units in August 2019 when the EIS was lodged).

Please do not hesitate to contact the undersigned should you wish to discuss.

Yours sincerely,

Bill Dean
General Manager – Projects
Malabar Coal Limited

Enclosure 4

Response to Matters Raised by Muswellbrook Shire Council

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30 April 2020

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Team Leader, Energy and Resource Assessments
NSW Department of Planning, Industry and Environment
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Sydney NSW 2001

By email: Lauren.Evans@planning.nsw.gov.au

Dear Lauren,

RE: MAXWELL PROJECT (SSD-9526) – RESPONSE TO RESIDUAL COUNCIL MATTERS

I refer to the Department of Planning, Industry and Environment's information request (dated 30 March 2020) and Muswellbrook Shire Council's email to the Department (dated 25 March 2020).

A complete response to each of the Department's information requests will be provided via the Major Projects Planning Portal by 30 April 2020.

In the interim, please find enclosed a response to each of the residual matters raised by the Muswellbrook Shire Council. This includes a comprehensive update on the biodiversity offset strategy for the Maxwell Project.

Please do not hesitate to contact the undersigned should you wish to discuss.

Yours sincerely,

Bill Dean
General Manager – Projects
Malabar Coal Limited

Enclosure 1 Malabar Response to Residual Issues Raised by Muswellbrook Shire Council

Enclosure 1

Malabar Response to Residual Matters Raised by Muswellbrook Shire Council

The NSW Department of Planning, Industry and Environment (DPIE) has received further email correspondence from Muswellbrook Shire Council (MSC) (dated 25 March 2020). MSC has requested additional information with respect to a number of residual matters relating to the Maxwell Project (SSD-9526) (the Project).

DPIE has reviewed MSC's correspondence and requested Malabar's response with respect to the:

a) Need for an adaptive biodiversity management plan with respect to subsidence impacts;

b) Establishment of a biodiversity corridor (including timing);

c) Realignment of Edderton Road; and

d) Terms of a potential Voluntary Planning Agreement (VPA) with respect to the Project.

Malabar's response to each of these residual matters is provided in the following sub-sections.

A. Adaptive Biodiversity Management Plan

Malabar has committed to preparing and implementing an adaptive biodiversity management plan as part of the Extraction Plans for the Project. Extraction Plans are an approval required by standard conditions of development consents for underground coal mines in NSW.

Malabar would accept a Development Consent condition to this effect.

Potential indirect impacts on habitat and vegetation listed in the NSW Biodiversity Assessment Method (OEH, 2016) (BAM) are assessed in Section 5.3 of the *Maxwell Project Biodiversity Development Assessment Report* (Hunter Eco, 2019) (BDAR). Key findings from the BDAR are summarised as follows

- Subsidence is unlikely to materially impact native vegetation (including threatened ecological communities) within the predicted subsidence area as surface cracks would be remediated.
- Potential impacts on trees (dieback or tree fall) are unlikely based on experience and monitoring results from similar underground mining operations elsewhere in the Hunter Valley.
- Prior to any subsidence remediation of surface cracks, Malabar would undertake a review of environmental impacts that would consider, among other factors, the known locations of threatened flora species and populations.
- The predicted subsidence is unlikely to have any measurable impact on any threatened fauna species. Prior to any remediation of surface cracks, Malabar would undertake a review of environmental impacts that would consider mapped rocky areas that may provide habitat for threatened lizards.

Section 5.3.1 and 5.6 of the BDAR describe the adaptive management approach to be undertaken in accordance with the Extraction Plan process.

Accordingly, the BDAR adequately describes and considers the types of entities that would be addressed in the adaptive biodiversity management plan.

B. Establishment of a Biodiversity Offset Corridor

Council Issue:

MSC has raised concerns regarding the delay for completion of a Biodiversity Corridor (to be established as part of the rehabilitation of the former Drayton Mine) due to the proposed Transport and Services Corridor.

Response

The location of the proposed woodland domains has been selected to provide a long-term woodland corridor that aligns with the *Synoptic Plan: Integrated Landscapes for Coal Mine Rehabilitation in the Hunter Valley of New South Wales* (DMR, 1999).

As a result of recent consultation with MSC, Malabar has committed to increasing the size of the proposed woodland domains through additional planting of 10 hectares to the east of the Project Transport and Services Corridor. This additional planting, (proposed for spring 2020), will provide for connectivity to the existing native woodland in the north-east corner of the mining licence (CL 229).

The additional area is shown on Figure 1 (see the green area bordered by a red dashed line south of the Access Road Dam).

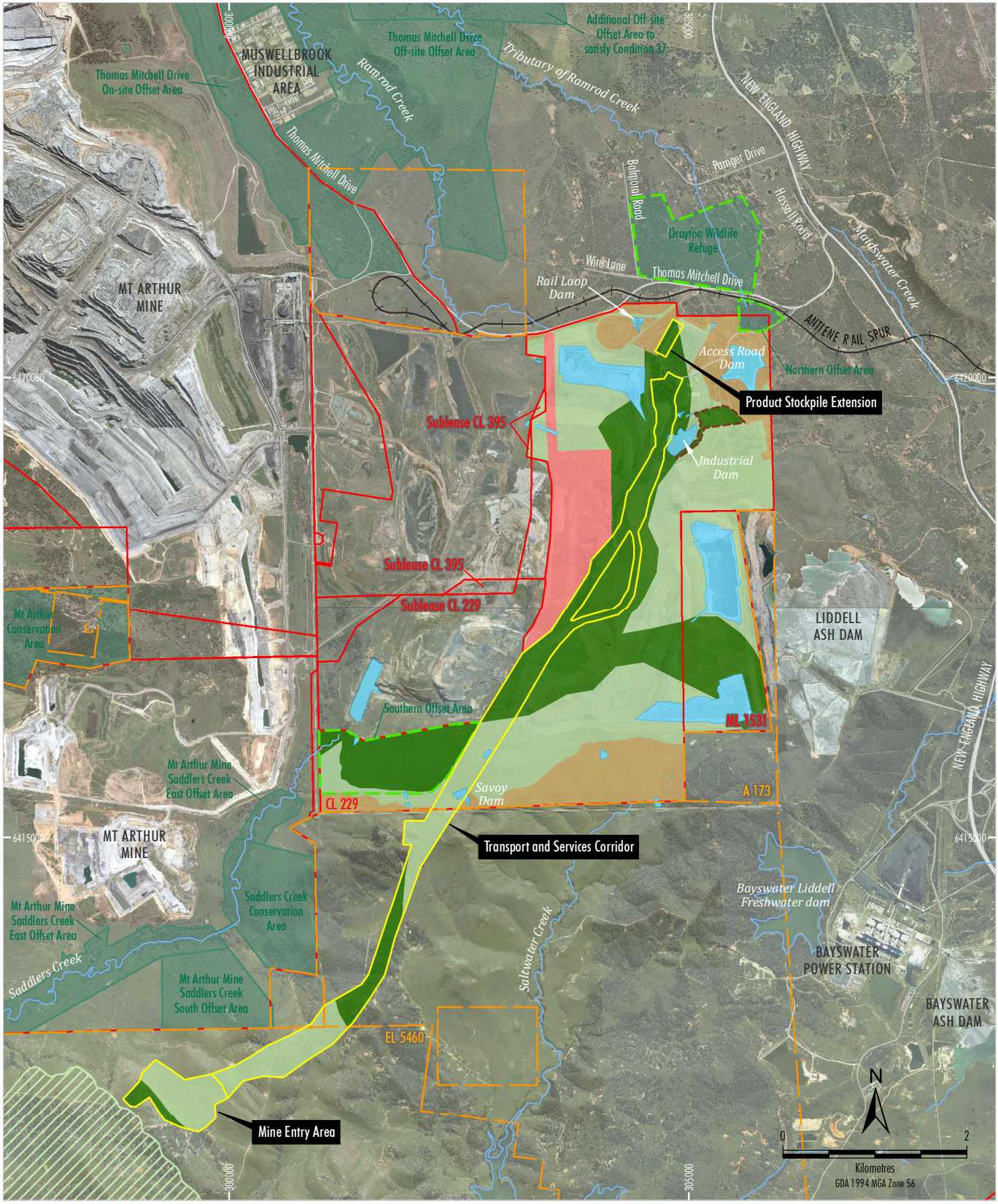
A summary of approved and proposed woodland domains is provided in Table 1. As demonstrated in Table 1, a significant area of 500 hectares of woodland would be established during the life of the Project.

Table 1
Summary of Approved and Proposed Woodland Rehabilitation

Rehabilitation Domains	Total Area (hectares)	Area to be planted by Spring 2020 (including existing rehabilitation)
Approved MOP – Woodland	444	285
Maxwell Project EIS – Proposed woodland	490	285
Maxwell Project – Revised proposed woodland as per this letter	500	295

In addition, MSC has previously requested further details on the biodiversity offset strategy for the Project, including the approach to offsetting threatened species and communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act). MSC's submission on the Maxwell Project (dated 14 October 2019) stated:

> *Having the applicant identifying and securing locally sourced offsets is the most desirable outcome as it gives a more transparent and certain conservation outcome to the development application.*



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LEGEND

- Railway
- Existing Conservation/Offset Area
- Exploration Licence Boundary
- Mining and Coal Lease Boundary
- Indicative Surface Development Area

Secondary Domains

- A Biodiversity Offset
- B Water Management
- C Pasture
- D Woodland
- D Additional Proposed Woodland
- E Buffer Land
- F Remediated Underground Mining Area
- G Maxwell Solar Project Infrastructure

Source: © NSW Department of Planning and Environment (2019); NSW Department of Finance, Services & Innovation (2019); MSEC (2019) Orthophoto Mosaic: 2018, 2016, 2011

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Rehabilitation Domains - Maxwell Infrastructure Area

Figure 1

Malabar has subsequently commissioned additional biodiversity surveys in the vicinity of the Project to ascertain the suitability of the land for offsets. Floristic plot data have been collected in accordance with the BAM and targeted surveys for Pink-tailed Legless Lizard habitat have been undertaken. As a result of these additional works, a suitable land-based offset has been identified in the vicinity of the Project (Figure 2).

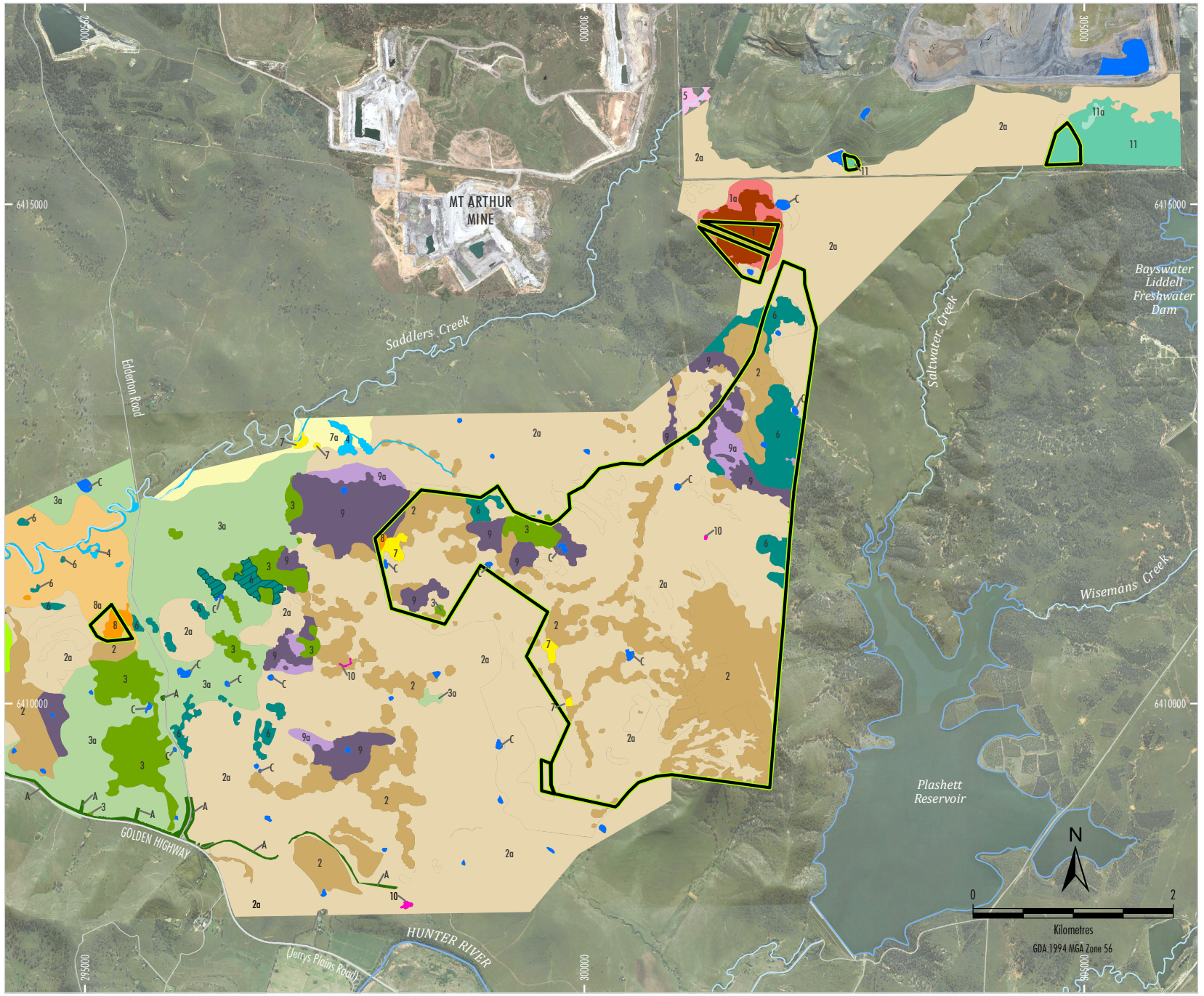
The land-based offset would satisfy all like-for-like biodiversity offset requirements for the Maxwell Project Stage 1 Offset (Tables 2 and 3), with some surplus credits also generated. Stage 1 includes all proposed components of the Maxwell Project, with the exception of the potential realignment of Edderton Road (potential Stage 2), as this would have a different operational timing requirement (refer Section C).

Table 2
Project Ecosystem Credit Requirements and Proposed Offset (Stage 1)

PCT	Plant Community Type Name	Maxwell Project Stage 1		Proposed Biodiversity Stewardship Site	
		Clearance Area (ha)	Credits Required	Area (ha)	Credits Generated
1607	Blakely's Red Gum – Narrow-leaved Ironbark – Rough-barked Apple shrubby woodland of the upper Hunter	5.3	68	20.4	68
1606	White Box – Narrow-leaved Ironbark – Blakely's Red Gum shrubby open forest of the central and upper Hunter	132.2	1,187	898.5	1,249
1655	Grey Box – Slaty Box shrub-grass woodland on sandstone slopes of the upper Hunter and Sydney Basin	1.2	21	13	52
1692	Bull Oak grassy woodland of the central Hunter Valley	2.8	45	64.4	155
201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	1.5	29	9.5	30
1691	Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter	7.9	190	66.4	260
1604	Narrow-leaved Ironbark – Grey Box – Spotted Gum shrub-grass woodland of the central and lower Hunter	1.3	44	10.4	44
1604	Woodland Rehabilitation*	15.2	214	N/A^	N/A^

* In accordance with advice from the New South Wales Office of Environment and Heritage (now Biodiversity and Conservation Division), mine rehabilitation that includes native flora species have been assessed by selecting the most likely pre-existing Plant Community Type and adding the vegetation zone into the Biodiversity Assessment Method Credit Calculator.

^ Proposed disturbance of existing woodland rehabilitation (15.2 hectares) would be offset by the establishment of additional woodland as part of the Project (56 hectares) (Table 1).



LEGEND

- Indicative Biodiversity Stewardship Site Assessment Footprint

Dry Sclerophyll Forests (Shrub/grass sub-formation)

- 1 Red Gum - Ironbark - Apple Shrubby Woodland (PCT1607)
- 1a Red Gum - Ironbark - Apple Shrubby Woodland - Derived Native Grassland (PCT1607)
- 2 White Box - Ironbark - Red Gum Shrubby Forest (PCT1606) [1]
- 2a White Box - Ironbark - Red Gum Shrubby Forest - Derived Native Grassland (PCT1606) [1]

Dry Sclerophyll Forests (Shrubby sub-formation)

- 3 Slaty Box Shrubby Woodland (PCT1655) [2]
- 3a Slaty Box Shrubby Woodland - Derived Native Grassland (PCT1655)

Forested Wetlands

- 4 Swamp Oak Forest (PCT1731)
- 5 Hunter Lowland Red Gum Forest (PCT1598)

Grassy Woodlands

- 6 Bull Oak Grassy Woodland (PCT1692)
- 7 Yellow Box - Apple Grassy Woodland (PCT1693) [1]
- 7a Yellow Box - Apple Grassy Woodland - Derived Native Grassland (PCT1693) [1]
- 8 Fuzzy Box Woodland (PCT201)
- 8a Fuzzy Box Woodland - Derived Native Grassland (PCT201)
- 9 Ironbark - Grey Box Grassy Woodland (PCT1691) [3]
- 9a Ironbark - Grey Box Grassy Woodland - Derived Native Grassland (PCT1691)
- 10 Weeping Myall Woodland (PCT116) [4]
- 11 Grey Box - Spotted Gum - Narrow-leaved Ironbark Woodland (PCT1604) [5]
- 11a Grey Box - Spotted Gum - Narrow-leaved Ironbark Woodland - Derived Native Grassland (PCT1604)

Other

- A Planted Trees
- B Cultivation
- C Waterbody/Dam

[1] Listed BC Act, White Box Yellow Box Blakely's Red Gum Woodland
[2] Listed BC Act, Hunter Valley Footslopes Slaty Gum Woodland
[3] Listed BC Act, Central Hunter Grey Box - Ironbark Woodland
[4] Listed BC Act, Hunter Valley Weeping Myall Woodland
[5] Listed BC Act, Central Hunter Ironbark - Spotted Gum - Grey Box Forest

Source: © NSW Spatial Services (2019)
Orthophoto Mosaic: 2018, 2016, 2011

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Indicative Biodiversity Stewardship Site

Figure 2

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Table 3
Project Species Credit Requirements and Proposed Offset (Stage 1)

Species	Conservation Status*		Maxwell Project Stage 1		Proposed Biodiversity Stewardship Site	
	BC Act	EPBC Act	Clearance Area (ha)	Credits Required	Area (ha)	Credits Generated
Pink-tailed Legless Lizard (*Aprasia parapulchella*)	V	V	36^	382	251^	392
Striped Legless Lizard (*Delma impar*)	V	V	145^	1,126	1,060^	1,804
Squirrel Glider (*Petaurus norfolcensis*)	V	-	41^	524	529^	1,110
Southern Myotis (*Myotis macropus*)	V	-	0.5^	9	35^	104

* Conservation status under the NSW *Biodiversity Conservation Act, 2016* (BC Act) and/or EPBC Act (current as at April 2020). V = Vulnerable.

^ Note that the species habitats overlap (i.e. the habitats are not mutually exclusive).

C. Realignment of Edderton Road

Three seams are proposed to be mined beneath Edderton Road (Woodlands Hill, Arrowfield and Bowfield Seams). The uppermost Woodlands Hill Seam ranges from 130 m to 260 m below Edderton Road.

Malabar has addressed potential impacts on Edderton Road by presenting two alternatives that would maintain both the safety and operability of Edderton Road. The two proposed options are: (i) subsidence management and normal road maintenance techniques along the existing alignment; or (ii) the realignment of the road around the Maxwell Underground area.

Malabar is seeking consent for both of these options as part of the Project.

Potential subsidence impacts on Edderton Road were comprehensively assessed by Mine Subsidence Engineering Consultants (MSEC) (2019) as part of the *Maxwell Project Subsidence Assessment*. The Subsidence Assessment was prepared in accordance with the Secretary's Environmental Assessment Requirements.

The maximum predicted change in grade (i.e. tilt) along the alignment of Edderton Road is 45 mm/m (i.e. 4.5%, or 1 in 22). The maximum predicted curvatures for Edderton Road are less than the curvatures predicted at the Blakefield South Mine, which involved multi-seam mining beneath Broke Road and Charlton Road (MSEC, 2019).

MSEC (2019) concluded that potential impacts on Edderton Road could be managed using visual monitoring and undertaking remediation of the road pavement during active subsidence.

Malabar met with MSC on 12 February 2020 and provided additional information regarding the management of potential subsidence impacts on Edderton Road. In summary:

- The duration of extraction beneath Edderton Road when each longwall panel passes would be approximately 10 weeks.

- No mining would occur beneath Edderton Road for extended periods of time between the extraction of each seam (Figure 3).
- For each longwall panel pass:
  - Notifications would be advertised in local newspapers one month in advance of each pass.
  - Speed restrictions would be imposed with a modest increased travel time along Edderton Road of approximately 2.3 minutes.
  - Safety would be maintained with 24-hour surveillance and monitoring, with a repair crew available to remediate any impacts as soon as they are observed.
- The predicted subsidence profile (i.e. post-mining road grade) is generally consistent with the grade along sections of the existing Edderton Road.

MSC's most recent submission highlights the closure of Wybong Road due to damage from activities on the Bengalla Mine. Malabar notes that the Bengalla Mine is an open cut mine and issues associated with open cut highwall stability are not directly comparable to the Maxwell Project.

Following feedback from the meeting and receipt of MSC's submission, Malabar wrote to MSC with the following revised proposal for the management of Edderton Road (letter dated 30 April 2020):

- **Mining of Whynot[1] and Woodlands Hill Seams**: Malabar would manage the subsidence of Edderton Road in-situ when mining the Woodlands Hill seam. This would be in accordance with a Principal Hazard Management Plan, developed in consultation with MSC under the NSW *Work Health and Safety (Mines and Petroleum Sites) Regulation, 2014*. *(Note[1]: the Whynot seam is not mined under Edderton Road).*
- **Mining of Arrowfield and Bowfield Seams**: Malabar would construct the relocation of Edderton Road prior to mining the Arrowfield seam.
- **Saddlers Creek Crossing**: The Saddlers Creek crossing would not be undermined by the Maxwell Underground. Notwithstanding, prior to mining the Arrowfield Seam, Malabar would upgrade the Saddlers Creek crossing. This would involve construction of:
  - approximately 700 metres of 2 lane sealed rural roadway;
  - a crossing of Saddlers Creek designed to handle a 1 in 100 year flow.

With the revised management approach above, Edderton Road would only be undermined for approximately 5% of the life of the Project (reduced from approximately 14%).

Malabar would accept a Development Consent condition that reflects the revised management approach for Edderton Road outlined above.

D. Voluntary Planning Agreement (VPA)

Following the most recent meeting between MSC and Malabar on 12 February 2020 to discuss the elements of the VPA.

Following that meeting, Malabar wrote to MSC with the following revised terms for a VPA (letter dated 30 April 2020):

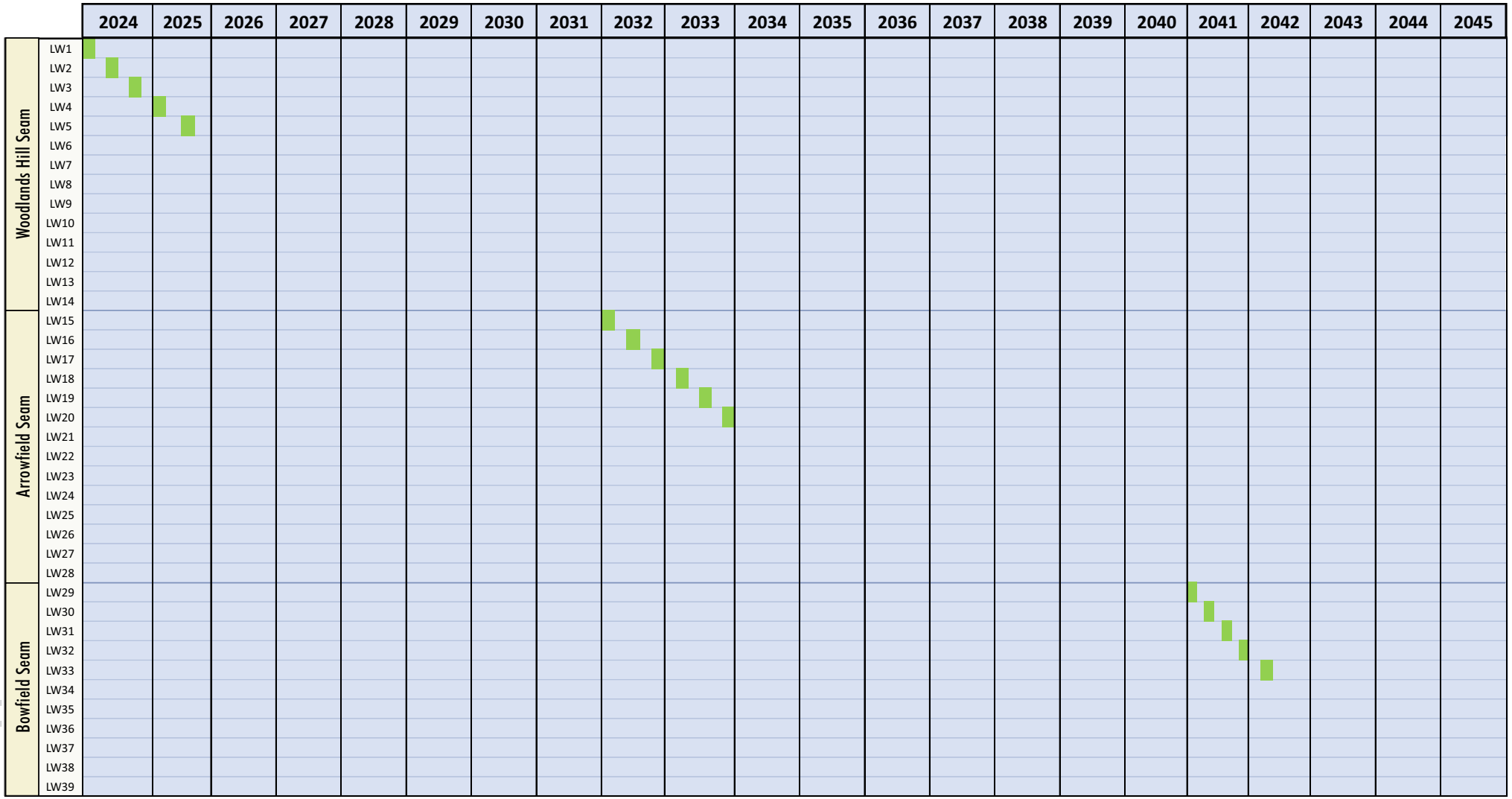
i. A contribution of 7 cents (escalating as per the Consumer Price Index [CPI]) for each tonne sold until the longwall commences operation in the Woodland Hill Seam. This contribution would be for community, road and infrastructure initiatives at MSC's discretion.

ii. From the time that longwall commences in the Woodland Hill Seam, a minimum contribution of $350,000 per annum plus 7 cents for each tonne in excess of 5,000,000 tonnes railed from the mine (escalating at CPI). As per item i, this contribution would be for community, road and infrastructure initiatives at the MSC's discretion.

iii. $20,000 per annum (escalating at CPI) would be contributed toward the employment of a MSC Environmental Officer.

iv. Malabar would use best endeavours to employ at least 2 apprentices a year up until the longwall commences. This would increase to at least 4 apprentices a year upon commencement of the longwall and would continue for the life of the Project.

These revised terms are summarised in Table 3, including a comparison to terms previously proposed by Malabar and MSC.



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LEGEND

Estimated 10 weeks Subsidence Management per Longwall Pass (monitoring plus temporary repairs)

NOTE

Longwall timing shown on this figure is indicative.

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Duration of Longwall Mining
Beneath Edderton Road

Figure 3

Table 3
Proposed VPA Terms

VPA Component	Malabar Offer (June 2019)	MSC Response (Nov. 2019)	Revised Terms Proposed by Malabar (April 2020)	
			Pre Longwall Mining	Longwall Mining Commenced
Community Contribution	$350,000 per year	$500,000 per year	7 cents per tonne	$350,000 per year plus 7 cents for each tonne above 5 Mtpa
Road and Infrastructure	Share of Thomas Mitchell Drive Maintenance	Annual payment based on tonnage produced	Included above, with additional payments set out below this table	
Contribution to a MSC Environmental Officer	$10,000 per year	$20,000 per year	$20,000 per year	
Training	One apprentice plus two trainees at any one time	Engage 4 apprentices per year for the life of the Project	Employ 2 apprentices per year	Employ 4 apprentices per year

In addition to the payments set out in Table 3, Malabar would:

- Pay its share of the capital for the completed upgrade and ongoing maintenance of Thomas Mitchell drive in accordance with the Thomas Mitchell Drive Contributions Study (as amended from time to time), administered by the DPIE.
- Pay MSC $47,300 for the “Mine Affected Roads Study”.
- Continue to support local education, charity and sporting organisations through its Community Contributions Fund. Despite not currently producing coal, Malabar has nonetheless contributed and committed to in excess of $500,000 to the community thus far.