

SANCROX QUARRY EXPANSION

**State Significant Development (SSD 7293)
Addendum to Biodiversity Assessment Report (BAR)**

Prepared for:

Hanson Construction Materials Pty Ltd
PARRAMATTA NSW 2124

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SLR 

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BASIS OF REPORT

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DOCUMENT CONTROL

Reference	Date	Prepared	Checked	Authorised
	22 March 2022			J Pepper

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1 Introduction

1.1 Overview

This Addendum is provided in response to clarification advice received from the Biodiversity Conservation Division (‘BCD’) regarding their position on the proposed Sancrox Quarry expansion project (the ‘project’) in their letter dated 16 September, as well as their previous submission on the Biodiversity Assessment Report (BAR), as per letter dated 23 June 2021.

Prior to addressing BCD comments, it is important to detail changes to the proposed development that have occurred since the Response to Submissions (RTS) phase of the project. The changes to the development are described below in **Section 1.2** and **Section 1.3**, with associated revised credit calculations completed using the Framework for Biodiversity Assessment (FBA) Calculator in **Section 1.4**.

1.2 Revised Pit Design

The layout of the proposed quarry has been modified (by Hanson, the proponent) since the Response to Submissions (RTS). In response to feedback received during the EIS exhibition and RTS phases, the pit surface extent (including ancillary infrastructure) has been reduced from around 60.6 hectares (ha)(as exhibited in the EIS) to 49.9 ha (as it is now currently proposed), a reduction of around 10.7 ha¹. This has reduced the total area of vegetation removal associated with the proposed quarry expansion to around 30.4 ha, compared to 43.1 ha as originally exhibited in the EIS² – a reduction of approximately 12.7 ha (or 30 % of the original area). The current proposed pit layout is shown in **Figure 1**.

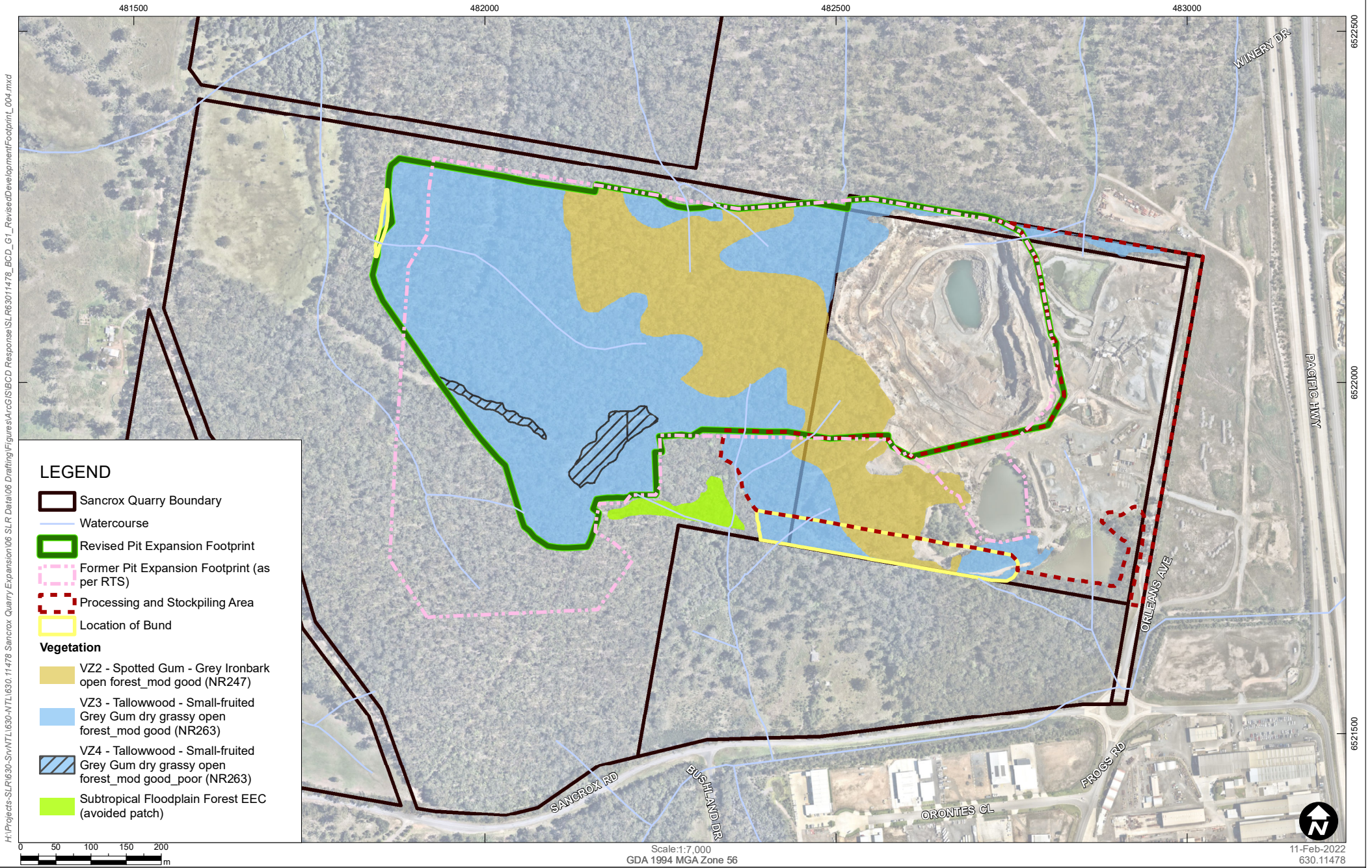
A comparison of the potential direct impacts on biodiversity, both in terms of calculated vegetation removal (using GIS) and in biodiversity credits (calculated using the FBA Calculator), including the reductions achieved in the quarry footprint, vegetation removal and biodiversity offset credit requirements, is listed in **Table 1**.

Table 1 Comparison of Quarry Footprint and Vegetation Removal from EIS to post-RTS

Project Component	EIS (BAR) Biodiversity Impacts	RTS Biodiversity Impacts (% reduction)	Final Project Biodiversity Impacts (% reduction)	Overall Reduction of Project Biodiversity Impacts (% reduction)
Total quarry footprint	60.60 ha	57.55 ha (5 %)	49.90 ha (13 %)	10.70 ha (17.6%)
Total area of vegetation removal	43.10 ha	39.02 ha (9.5 %)	30.40 ha (22 %)	12.70 ha (30 %)
Biodiversity credits required for offsetting	2449 ecosystem credits	2,230 ecosystem credits (219 less credits) 1,026 Koala credits (New credits)	1,701 vegetation credits (529 less credits) 789 Koala credits (237 less credits)	923 ecosystem credits (37.7 %) 237 Koala credits (23 %)

¹ The pit extent area proposed in the Response to Submissions was 57.55 ha

² The area of vegetation removal calculated in the Response to Submissions was 39.02 ha.



1.3 Quarry Staging Plan

Importantly, the proposed pit expansion works would be carried out in stages, with portions of each stage to be cleared annually (as needed and on a campaign basis) over several years.

- Stage 1: 1-10 years
- Stage 2: 10-20 years
- Stage 3: 20-30 years

The main pit expansion stages are shown in **Figure 2**. Further details on staging are provided in the EIS.

1.4 Revised Impacts and Credit Calculations

1.4.1 Revised FBA Credit Results

Importantly, the residual impacts on biodiversity values that could not be avoided in the design of the project have been offset using credit calculations completed according to Section 8 of the FBA. The biodiversity credits required to offset the project (as detailed in Section 6.5 of the BAR) have been re-calculated using the FBA Calculator. A total of 1,701 ecosystem credits and 789 species credits for the Koala would be required to offset the clearing of native vegetation as part of the proposed development.

Current (revised) FBA credit calculations are listed below in **Table 2**, and updated Credit Reports from the FBA Calculator are provided in **Appendix A**.

Table 2 Updated FBA Credit Calculations

Plant Community Type (PCT)	Veg Zone Area (ha)	Credits
Ecosystem Credits		
Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion	10.03	455
Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	20.33	1,246
Total	30.36	1,701
Species Credits		
Koala <i>Phascolarctos cinereus</i>	30.36	789

1.4.2 Revised FBA Offset Credit Comparison

Section 7.8 of the BAR provides a discussion of potential offsetting options for the Sancrox Expansion Project. The preferred offsetting option for the proposed development involves a combination of generating credits from a proposed offset area located in the northern portion of Lot 2 DP 574308 and purchasing credits from the credit register, and/or depositing the equivalent amount in the Biodiversity Conservation Fund. The proposed offset site is located immediately north-northwest of the proposed quarry expansion area, is approximately 49 ha and occupies low lying land containing swampy vegetation types and open cleared grassland that is used for cattle grazing.

A comparison of the ecosystem credits required for offsetting the proposed development and those potentially available in the Offset Site is provided in **Table 29** of the BAR. The credit results for offsetting the development impacts have been updated to be consistent with the updated results presented in this Addendum in **Table 3**.

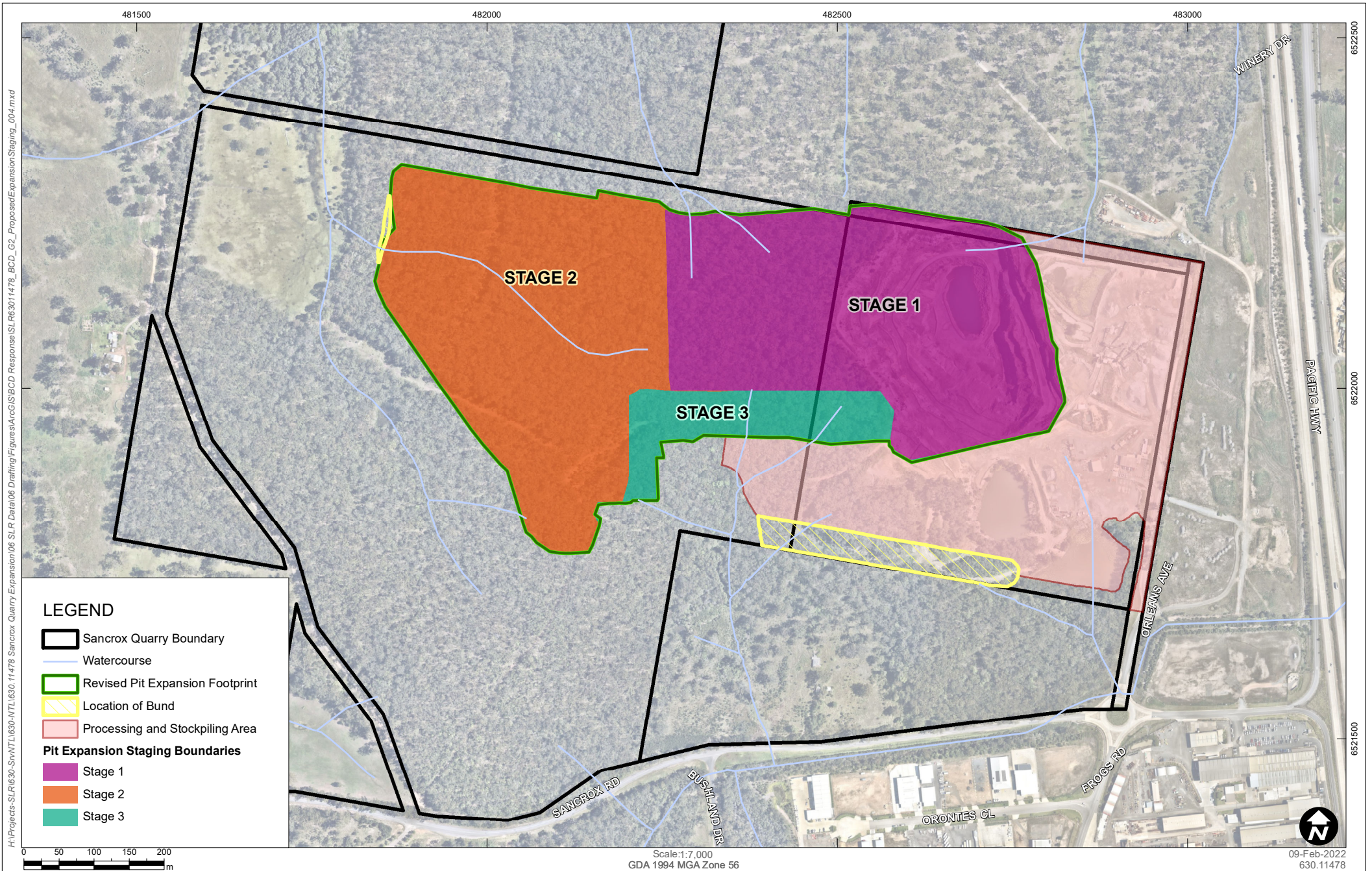
Table 3 Biodiversity Credit Balance – Credits Required vs Credits Generated in Offset

Biometric Code	Vegetation Type Name	FBA Credits Required	Credits in Offset	Remaining Credits to Purchase
NR247	Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion	455	0	455
NR263	Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	1246	135	1,111
NR254	Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion	0	14	0
NR217	Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	0	353	0
	Koala Species Credits	789	191	598

The ecosystem credits that form the offset obligation for the proposed development, as listed in **Table 3**, would either be sourced from the Offset Site and/or purchased from the BioBanking Credit Register (if available), with remainder converted into a monetary value using the BOPC and that value paid into the Biodiversity Conservation Fund (BCF). As the number and type of credits that will be available for purchase from the credit register following development approval is not known, the final payment into the Fund will be determined at the completion of the EOI period.

A total of 789 Koala species credits are required for offsetting the proposed development, and around 191 could be generated in the Offset Site. This would leave a balance of 598 Koala species credits still required to be purchased (and retired) or an equivalent BCF payment (**Table 3**).

Targeted threatened species surveys have not been conducted in the proposed Offset Site; however, given the habitats and vegetation types present, it is possible that one or more threatened species could be present. Hence, the Offset Site could generate additional species credits, although this will need to be confirmed through targeted surveys (during the appropriate season) as part of any future Stewardship Agreement application.



2 BCD Issues Raised on BAR

This BAR Addendum addresses issues raised in the following submissions from the BCD:

- *Clarification of BCD Advice – Sancrox Quarry Expansion Project (SSD 7293)* - Letter to DPIE dated 16th September 2021 (Ref: DOC21/803704); and
- *Sancrox Quarry Expansion Project (SSD 7293) (Port Macquarie Hastings)* - Letter to DPIE dated 23rd June 2021 (Ref: DOC21/425864);.

Copies of both submissions are provided in **Appendix B**.

This Addendum does not address comments made by BCD in previous submissions (11th December 2019 and 3rd April 2020), as the above listed submissions are assumed to supersede these earlier submissions.

BCD issues raised in their June 2021 submission are as follows:

- Further information must be provided in the BAR and calculator in accordance with the FBA and operational manuals.
- The anomaly in the BAR and FBA calculator regarding the number of plots for vegetation zone NR 263 Mod/Good must be corrected.
- Further avoidance of biodiversity values should be incorporated into the proposed development.
- Further avoid and mitigate options need to be considered as part of the proposal to reduce the impact on koalas, their habitat, and their movement corridors.
- The indirect impacts of the development have not been considered in accordance with the FBA and further information and justification is required.

Issues raised by the BCD in their June 2021 submission are listed in **Table 3**, with SLR's responses provided. Where further explanation or detail is required to address an issue raised, detailed responses are provided below in **Section 3**.

Issues raised by the BCD in their September 2021 submission relate to the acceptability of impacts on vegetation and Koala habitat and the need for greater impact avoidance. SLR's responses to these matters are provided in a separate letter, a copy of which is provided in **Appendix C**.

Table 4 Summary of BCD comments and SLR Responses

BCD Issue	BCD Recommendation	Description	SLR Response	Action
Finalising FBA Calculator	Further information must be provided in the BAR and calculator in accordance with the FBA and operational manuals.	FBA Calculator has not been finalised (ie still WIP status)	FBA Calculator project (0107/2015/2368MP) now being edited again by BBAM Assessor J Pepper (#0107)	Submit final Sancrox FBA project in FBA Calculator (when BCD comments addressed)
FBA Landscape Score		Landscape value – no change in % cleared value in outer assessment circle after development – explanation required	See BAR Section 2.9.1. (inc. Table 5). Pre-development native veg. extent in outer circle is 452.74 ha (45 % of 1000 ha); post extent is 413.27 ha (41 %). Hence the % cleared is 41-45 % before and after development Note: % cleared value for post-development has changed (due to reduced clearing area of development) – see discussion below.	See Section 3.1 below
		FBA ‘connectivity score’ has not been discussed or mapped in BAR	The approach to calculating connectivity score is described in Section 2.9.12 of the BAR. Detailed step-through of FBA connectivity score now provided with connectivity maps	See Section 3.1 below

BCD Issue	BCD Recommendation	Description	SLR Response	Action
FBA Site Value Score	The anomaly in the BAR and FBA calculator regarding the number of plots for vegetation zone NR 263 Mod/Good must be corrected.	BAR (Table 11) indicates 4 plots completed in veg zone 3 NR263 Mod-Good; however 5 plots appear in the FBA Calculator	Table 11 incorrectly lists 4 plots for Veg Zone 3. Five plots were samples within Veg Zone 3, as per the FBA Calculator	See Section 3.2 below Provide updated Table 11 to show 5 plots for Veg Zone 3
Avoiding Impacts	Further avoidance of biodiversity values should be incorporated into the proposed development.		See response below	See Section 3.3 below. (See Appendix C)
Koala Impacts	Further avoid and mitigate options need to be considered as part of the proposal to reduce the impact on koalas, their habitat, and their movement corridors.		See response below	See Section 3.4 below
Indirect Impacts	The indirect impacts of the development have not been considered in accordance with the FBA and further information and justification is required.		See response below	See Section 3.5 below

3 Detailed Responses to BCD Comments

3.1 FBA Landscape Score

In relation to the calculation of Landscape Value in the BAR, the BCD raise the following matters in their June and September submissions:

- BCD argue that impacts on ‘biodiversity and habitat connectivity’ must be reduced and justified “consistent with the Framework for Biodiversity Assessment” (September 2021).
- BCD requested an explanation for the fact that there was no change in the percentage (%) cleared value in the outer assessment circle before and after development.
- BCD state that the “connectivity score in the calculator has not been discussed or mapped in BAR”.

In relation to the above matters, the following responses are provided:

3.1.1 Impacts on Habitat Connectivity

A detailed response on impact avoidance measures and measures to provide for habitat connectivity (including Koala habitat) is provided in the attached letter in **Appendix C**.

3.1.2 Future extent of native vegetation cover

BCD requested an explanation for the fact that there was no change in the percentage (%) cleared value in the outer assessment circle before and after development. In reply, as listed in Table 5 of the BAR (as submitted with the RTS), the pre-development native vegetation extent in the outer circle was calculated (using GIS and available regional scale mapping) as 452.74 ha, which equates to 45 % of the 1000 ha outer circle and fits into the FBA category of 41-45 %. The calculated post-development native vegetation area was 413.27 ha (41 %), which also falls into the 41-45 % category. Hence the % cleared scores in the FBA calculator were 41-45 % before and after development.

However, the percentage (%) cleared value for post-development has changed, due to the reduction in the development footprint, which is now calculated at 30.36 ha. A revised version of Table 5 from the BAR showing updated percentage native vegetation cover scores for the inner and outer assessment circles for the pre-development and post-development phases, is listed below in **Table 4**.

Table 5 Percent vegetation cover in the landscape[#]

Landscape Circle	Circle Area (ha)	Existing Veg. Cover	FBA Class	Future Veg. Cover	FBA Class
Inner	100	84.48 ha (84 %)	81-85 %	54.12 ha (54 %)	51-55 %
Outer	1000	452.74 ha (45 %)	41-45 %	422.38 ha (42 %)	41-45 %

[#] Revised version of Table 5 of the BAR; values changed from Table 5 in RTS are in **bold**.

The only change the % cleared scores in the FBA, as shown above in **Table 4**, is the future extent of native vegetation cover within the inner assessment circles is now in the FBA cover class of 51-55 %. This has been updated in the FBA Credit Calculator for the inner assessment circle. The amended percentage native vegetation cover score in the Credit Calculator is now 1.95 (previously 2.95).

3.1.3 FBA Connectivity Assessment

Connectivity of habitat is discussed in Section 2.9.2 of the BAR. In their September letter, the BCD argue that impacts on ‘biodiversity and habitat connectivity’ must be reduced and justified “consistent with the Framework for Biodiversity Assessment”. In this regard, we note that the habitat connectivity assessment in the BAR was completed in accordance with the methods outlined in Appendix 4 of the FBA. A detailed step-through of the FBA connectivity assessment procedure (as per Appendix 4 of the FBA) is provided in our letter attached in **Appendix C**.

The FBA connectivity assessment can be summarised as follows:

- no State or regional biodiversity links occur within the Development Site
- The number of linkage width classes crossed as a result of the impact of the proposed development on the primary north-south link is ‘1’ one (changing from >100 m-500 m to >30 m-100 m)
- linkage condition class (of woody vegetation) within the over-storey (canopy) and mid-storey/ groundcover is assumed to be within benchmark before and after the proposed development. Hence no linkage condition classes are crossed (i.e. no change in linkage condition class). The score for linkage condition class is therefore ‘3’ according to the FBA.
- As one linkage width classes was crossed and no condition class thresholds crossed, the final connectivity score (as per Table 14 in Appendix 4 of the FBA) is ‘2’.

FBA connectivity maps (ie showing theoretical connecting links of habitat across the site) are now provided in **Attachment D**.

Combined with a patch size score of 12, the revised overall Landscape Value score in the FBA Calculator is 12.

3.2 Site Value Score (plot discrepancy)

The BCD note that the BAR (Table 11) indicates that four (4) plots were completed in vegetation zone 3 (VZ3) NR263 Mod-Good. However, five plots appear in the FBA Calculator. We note that five (5) plots were completed in VZ3 and that Table 11 incorrectly lists four plots. This has been corrected in **Table 5** below. The current vegetation zones, their mapped extent within the site and number of FBA plots completed within each zone are listed in **Table 5**.

Table 6 Vegetation Zones mapped within the Development Site

No.	Vegetation Zone name	Vegetation type name	Area (ha)	Min plots [#]	Plots done
2	NR247_Moderate/Good	Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion	10.03	3	3
3	NR263_Moderate/Good	Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	19.58	3	5
4	NR263_Moderate/Good_Poor	Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	0.75	1	1
		Total	30.36	7	9

Minimum number of plots required in the FBA.

The distribution of these vegetation zones within the development site, as well as the location of plot/transects, is shown in Figure 8 in the BAR.

3.3 Impact Avoidance Measures

Impact avoidance measures incorporated into the current pit layout and the project in general, and measures to address the removal of vegetation associated with the proposed development are discussed in the latter attached in **Appendix C**.

3.4 Impacts on the Koala

In their June 2021 submission, the BCD state that, in relation to the impacts identified within the BAR submitted with the RTS, the "...large impact to Koala habitat is not acceptable...". Whilst in their September submission, they state that "a substantial reduction of the development footprint is required", noting that "the proposed impact area contains habitat for the koala".

A detailed response on impact avoidance, including for Koala habitat, is provided in **Appendix C**. A summary of the response to these broader impact issues is provided below.

We note that further reductions in the impacts on Koala habitat have been incorporated into the development design since the RTS, as detailed in **Table 1** above, as follows.

- Species credits for impacts on the Koala were not originally included in the BAR (due to a lack of evidence of Koala activity on the site); however, species credits were calculated and included in the FBA credit calculations in the BAR provided with the RTS, due to the presence of the Koala recorded during targeted surveys conducted in late 2020. A total of 1,026 Koala species credits were calculated to offset impacts on Koala habitat as part of the RTS.
- The number of Koala species credits calculated as part of the current pit design (as described herein) is 789, a reduction of 237 credits from the RTS impact assessment (1,026 credits). The current FBA credit reports are provided in **Appendix A**.
- Impacts on Koala habitat have been reduced from 43.1 ha in the original BAR, to 30.4 ha as part of the current design, a reduction of 12.7 ha or 30 %.

Overall, in relation to BCD comments on impacts on the Koala:

- Impact avoidance measures have been applied to the proposed development, allowing for the reduction in Koala habitat loss of around 30 % from the original EIS (BAR) submission.
- The redesign of the development footprint that has occurred since the EIS submission, through the RTS process and to the current pit layout, demonstrates a commitment from the proponent to applying an iterative design process to reduce biodiversity impacts. This design and impact reduction process is consistent with the FBA recommendations for impact avoidance.
- The current design allows for retention of forested areas to the west of the proposed pit that will retain Koala habitat *in situ* and allow potential for north-south movement of the Koala, and provides for revegetation of currently cleared grazing pasture (further to the west) for the purpose of re-establishing Koala habitat.

On the basis of the above measures and commitments from the proponent, the impacts on the Koala are considered to be acceptable. Where impacts on Koala habitat are unavoidable, the purchase and retirement of species credits will be applied to compensate for the loss of Koala habitat, in accordance with the FBA.

3.5 Indirect Impacts

The BCD contend that the indirect impacts associated with the proposed development should be quantified, with the calculation of biodiversity credits to offset the indirect impacts identified according to the FBA. However, we disagree that indirect impacts associated with the proposed quarry expansion are likely to impose any significant adverse effects on locally occurring flora and fauna, including the Koala or other threatened species that could potentially occur around the periphery of the existing pit and the proposed expansion pit. (Notably a Koala was recorded within a few metres of the existing pit during targeted surveys in November 2020).

Potential indirect impacts on biodiversity associated with the proposed development are identified in Section 5.4 of the BAR. We note that the FBA³ does not contain a method for quantifying indirect impacts. The indirect impacts likely to occur are already occurring as part of the current operation and the proposed quarry expansion will not create any new indirect impacts. Any such impacts are likely to be localised (ie restricted to the immediate periphery of the pit and haul roads) and limited in severity and can be addressed through suitable mitigation measures (designed to minimise the risk of adverse effects arising from indirect impacts), which are provided in **Section 5.5** of the BAR.

Given the above considerations, the retirement of biodiversity credits to offset any indirect impacts is not warranted.

4 Conclusion

This Addendum addresses comments made by the BCD in their September 2021 letter which criticises the current design of the Sancrox Quarry Expansion project, notably that it does not sufficiently avoid impacts on biodiversity values and requests further avoidance measures and further consideration of connectivity impacts to demonstrate compliance with the FBA.

In reply, it is our contention that the BAR has been prepared in accordance with the FBA and that avoidance measures have been incorporated into the design of the proposed development progressively as part of an iterative design process for the quarry expansion, which is entirely consistent with the process for impact avoidance outlined in the FBA.

In conclusion and in response to the BCD comments:

- The site selection process, pit layout design and associated impact avoidance measures, as described in the BAR, are in accordance with the guidelines provided in Section 8.3.2 of the FBA.
- The current proposed layout of the quarry has been modified since the original concept design in response to biodiversity values identified on site as a result of ecological investigations conducted as part of the preparation of the BAR. As a result, impacts on native forest vegetation and associated connecting habitat for the Koala and other native fauna species have been substantially reduced.

³ Furthermore, it is noted that the BAM does not determine a credit obligation for indirect impacts.

- Avoidance measures built into the design of the quarry expansion and described herein and in the BAR have (i) reduced the quantum of native vegetation clearing, (ii) avoided removal of EEC vegetation and (iii) allowed for retention of a north-south vegetated link (and Koala habitat movement corridor) across the site.
- Impacts on the Koala have been reduced to acceptable levels, with the retraction of the pit further to east, and the commitment to revegetate currently cleared areas to restore Koala habitat to the west of the pit. These measures will allow for a greater width of Koala habitat to the west of the proposed pit expansion area and allow for north-south movement of Koalas.

Other matters raised by the BCD in relation to Landscape Value score and Site Value score in the FBA have been addressed above.

Further detailed response to other BCD comments on the BAR made in June 2021 as part of the Response to Submissions (RTS) on the EIS is provided in **Appendix C**.

APPENDIX A

FBA Credit Reports

BioBanking Credit Calculator

Ecosystem credits

Proposal ID : 0107/2015/2368MP
 Proposal name : Sancrox Quarry Expansion (SSD) - 2022 version
 Assessor name : Jeremy Pepper
 Assessor accreditation number : 0107
 Tool version : v4.0
 Report created : 25/02/2022 15:06

Assessment circle name	Landscaps score	Vegetation zone name	Vegetation type name	Condition	Red flag status	Management zone name	Management zone area	Current site value	Future site value	Loss in site value	Credit required for bio diversity	Credit required for TS	TS with highest credit requirement	Average species loss	Species TG Value	Final credit requirement for management zone
Circle 1	16.00	NR247_Moderate/Good	Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion	Moderate/Good	Yes	MZ2	10.03	55.21	0.00	55.21	0	455	Barking Owl	100.00	3.00	455
Circle 1	16.00	NR263_Moderate/Good	Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	Moderate/Good	Yes	MZ3	19.58	78.00	0.00	78.00	0	1,224	Masked Owl	100.00	3.00	1,224
Circle 1	16.00	NR263_Moderate/Good_Poor	Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	Moderate/Good_Poor	Yes	MZ4	0.75	32.89	0.00	32.89	0	22	Masked Owl	22.22	3.00	22

BioBanking Credit Calculator

Species credits

Proposal ID : 0107/2015/2368MP
Proposal name : Sancrox Quarry Expansion (SSD) - 2022 version
Assessor name : Jeremy Pepper
Assessor accreditation number : 0107
Tool version : v4.0
Report created : 25/02/2022 15:06

Scientific name	Common name	Species TG value	Identified population?	Can Id. popn. be offset?	Area / number of loss	Negligible loss	Red flag status	Number of credits
Phascolarctos cinereus	Koala	2.60	No		30.36	0.00	No	789

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 25/02/2022

Time: 3:03:22PM

Calculator version: v4.0

Major Project details

Proposal ID: 0107/2015/2368MP

Proposal name: Sancrox Quarry Expansion (SSD) - 2022 version

Proposal address: Sancrox Road Sancrox NSW 2446

Proponent name: Hanson Construction Materials Pty Ltd

Proponent address: Locked Bag 5260 Parramatta NSW 2124

Proponent phone: 61 2 9354 2638

Assessor name: Jeremy Pepper

Assessor address: Level 3 10 Kings Road New Lambton NSW 2305

Assessor phone: 02 4037 3200

Assessor accreditation: 0107

Summary of ecosystem credits required

Plant Community type	Area (ha)	Credits created
Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion	10.03	455.00
Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast	20.33	1,246.00
Total	30.36	1,701

Credit profiles

1. Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast, (NR263)

Number of ecosystem credits created

1,246

IBRA sub-region

Macleay Hastings - Northern Rivers

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast, (NR263)</p> <p>Blackbutt - Tallowood dry grassy open forest of the central parts NSW North Coast Bioregion, (NR119)</p> <p>Blackbutt - Turpentine open forest of the foothills of the NSW North Coast Bioregion, (NR124)</p> <p>Blackbutt grassy open forest of the lower Clarence Valley of the NSW North Coast Bioregion, (NR125)</p> <p>Brush Box tall moist forest of the northern ranges of the NSW North Coast Bioregion, (NR144)</p> <p>Red Mahogany open forest of the coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion, (NR222)</p> <p>Tallowood dry grassy forest of the far northern ranges of the NSW North Coast Bioregion, (NR267)</p>	<p>Macleay Hastings - Northern Rivers and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

2. Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion, (NR247)

Number of ecosystem credits created

455

IBRA sub-region

Macleay Hastings - Northern Rivers

Offset options - Plant Community types	Offset options - IBRA sub-regions
Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion, (NR247)	Macleay Hastings - Northern Rivers and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Summary of species credits required

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Koala	Phascolarctos cinereus	30.36	789

BioBanking Credit Calculator

Vegetation zones requiring transects/plots survey

Proposal ID : 0107/2015/2368MP
Proposal name : Sancrox Quarry Expansion (SSD) - 2022 version
Assessor name : Jeremy Pepper
Assessor accreditation number : 0107
Tool version : v4.0
Report created : 01/03/2022 15:39

Vegetation zone name : NR247_Moderate/Good

Vegetation type: Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion
Vegetation condition: Moderate/Good **Ancillary code:** NR247
Total area of zone (ha): 10.03 **Number of TS subzones in the zone:** 4
Minimum number of survey transects/plots required within the zone: 3

Vegetation zone name : NR263_Moderate/Good

Vegetation type: Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Vegetation condition: Moderate/Good **Ancillary code:** NR263
Total area of zone (ha): 19.58 **Number of TS subzones in the zone:** 4
Minimum number of survey transects/plots required within the zone: 3

Vegetation zone name : NR263_Moderate/Good_Poor

Vegetation type: Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Vegetation condition: Moderate/Good_Poor **Ancillary code:** NR263
Total area of zone (ha): 0.75 **Number of TS subzones in the zone:** 4
Minimum number of survey transects/plots required within the zone: 1

BioBanking Credit Calculator

Threatened species predicted on site

Proposal ID : 0107/2015/2368MP
Proposal name : Sancrox Quarry Expansion (SSD) - 2022 version
Assessor name : Jeremy Pepper
Assessor accreditation number : 0107
Tool version : v4.0
Report created : 01/03/2022 15:37

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common name	Scientific name	Vegetation type(s)
Barking Owl	Ninox connivens	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Barred Cuckoo-shrike	Coracina lineata	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus</i> subsp. <i>victoriae</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Bush Stone-curlew	<i>Burhinus grallarius</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Diamond Firetail	<i>Stagonopleura guttata</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Diamond Firetail	<i>Stagonopleura guttata</i>	NR263 - Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	NR263 - Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Eastern Freetail-bat	<i>Mormopterus norfolkensis</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Hoary Wattled Bat	<i>Chalinolobus nigrogriseus</i>	NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata</i> subsp. <i>cucullata</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion
Little Eagle	<i>Hieraaetus morphnoides</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Little Eagle	Hieraetus morphnoides	NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Little Lorikeet	Glossopsitta pusilla	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Long-nosed Potoroo	Potorous tridactylus	NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Masked Owl	Tyto novaehollandiae	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Masked Owl	<i>Tyto novaehollandiae</i>	NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Powerful Owl	<i>Ninox strenua</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Scarlet Robin	<i>Petroica boodang</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Square-tailed Kite	<i>Lophoictinia isura</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Square-tailed Kite	<i>Lophoictinia isura</i>	NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Swift Parrot	<i>Lathamus discolor</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion
Varied Sittella	<i>Daphoenositta chrysoptera</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast
Yellow-bellied Glider	<i>Petaurus australis</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

Common name	Scientific name	Vegetation type(s)
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	NR247 - Spotted Gum - Grey Ironbark open forest of the Macleay Valley lowlands of the NSW North Coast Bioregion NR263 - Tallowwood - Small-fruited Grey Gum dry grassy open forest of the foothills of the NSW North Coast

BioBanking Credit Calculator

Threatened species requiring survey

Proposal ID : 0107/2015/2368MP
Proposal name : Sancrox Quarry Expansion (SSD) - 2022 version
Assessor name : Jeremy Pepper
Assessor accreditation number : 0107
Tool version : v4.0
Report created : 01/03/2022 15:33

List of species requiring survey

Common name	Scientific name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Biconvex Paperbark	Melaleuca biconvexa	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Brush-tailed Phascogale	Phascogale tapoatafa	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Common Planigale	Planigale maculata	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eastern Chestnut Mouse	Pseudomys gracilicaudatus	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Eastern Pygmy-possum	Cercartetus nanus	N	N	N	N	N	N	N	N	N	N	N	N
Green-thighed Frog	Litoria brevipalmata	Y	Y	Y	N	N	N	N	N	N	Y	Y	Y
Grove's Paperbark	Melaleuca groveana	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Koala	Phascolarctos cinereus	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Leafless Tongue Orchid	Cryptostylis hunteriana	Y	Y	N	N	N	N	N	N	N	N	Y	Y
Milky Silkpod	Parsonsia dorrigoensis	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
North Brother Wattle	Acacia courtii	Y	N	N	N	N	N	N	N	N	N	Y	Y
Pale-headed Snake	Hoplocephalus bitorquatus	Y	Y	Y	Y	N	N	N	N	N	Y	Y	Y
Pale-vented Bush-hen	Amauornis moluccana	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Parma Wallaby	Macropus parma	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Red-backed Button-quail	Turnix maculosus	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Common name	Scientific name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Regent Honeyeater	<i>Anthochaera phrygia</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Rufous Bettong	<i>Aepyprymnus rufescens</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Rusty Plum, Plum Boxwood	<i>Niemeyera whitei</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Scant Pomaderris	<i>Pomaderris queenslandica</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Squirrel Glider	<i>Petaurus norfolcensis</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Stephens' Banded Snake	<i>Hoplocephalus stephensii</i>	N	N	N	N	N	N	N	N	N	N	N	N
Tree Guinea Flower	<i>Hibbertia hexandra</i>	N	N	N	N	N	N	N	N	Y	Y	Y	Y
White-flowered Wax Plant	<i>Cynanchum elegans</i>	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Willawarrin Doubletail	<i>Diuris disposita</i>	N	N	N	N	N	N	N	N	Y	Y	N	N

BioBanking Credit Calculator

Threatened species loss summary

Proposal ID : 0107/2015/2368MP
Proposal name : Sancrox Quarry Expansion (SSD) - 2022 version
Assessor name : Jeremy Pepper
Assessor accreditation number : 0107
Tool version : v4.0
Report created : 25/02/2022 15:14

Common name	Scientific name	Is it an identified population?	Can identified population be offset?	Loss	Units	Red flagged?
Koala	Phascolarctos cinereus	No		30.36	ha	No

APPENDIX B

BCD Submissions



Our Ref: DOC21/425864
Your Ref: SSD-7293

Department of Planning Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Attention: Ms Melissa Anderson

Dear Ms Anderson

RE: Sancrox Quarry Expansion Project (SSD-7293) (Port Macquarie-Hastings)

Thank you for your notification dated 25 May 2021 about the proposed quarry expansion development at Sancrox in Port Macquarie seeking comments from the Biodiversity and Conservation Division (BCD) of the Biodiversity, Conservation and Science Directorate in the Environment, Energy and Science Group of the Department of Planning, Industry and Environment. I appreciate the opportunity to provide input.

We have previously provided comment in relation to this proposed development on 11 December 2019 and 3 April 2020.

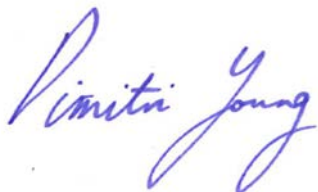
We have reviewed the latest Biodiversity Assessment Report (BAR) prepared by SLR dated May 2021 and have identified several issues in relation to the BAR which are discussed in detail in **Attachment 1** to this letter.

In summary, the BCD recommends that:

1. Further information must be provided in the BAR and calculator in accordance with the FBA and operational manuals.
2. The anomaly in the BAR and FBA calculator regarding the number of plots for vegetation zone NR 263 Mod/Good must be corrected.
3. Further avoidance of biodiversity values should be incorporated into the proposed development.
4. Further avoid and mitigate options need to be considered as part of the proposal to reduce the impact on koalas, their habitat, and their movement corridors.
5. The indirect impacts of the development have not been considered in accordance with the FBA and further information and justification is required.

If you have any questions about this advice, please do not hesitate to contact Mr Krister Waern, Senior Operations Officer, at krister.waern@environment.nsw.gov.au or 6640 2503.

Yours sincerely



23 June 2021

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

Enclosure: Detailed BCD Comments – Sancrox Quarry, Port Macquarie

Attachment 1: Detailed BCD Comments – Sancrox Quarry, Port Macquarie

The Biodiversity and Conservation Division (BCD) has reviewed the latest Biodiversity Assessment Report (BAR) prepared by SLR dated May 2021 and we provide the following comments.

Finalising FBA Calculator

We note that the Framework for Biodiversity Assessment (FBA) has been used to assess and determine the impacts of the proposal. Although the BAR has been provided, the FBA calculator to determine the biodiversity credit requirement has not been finalised. The FBA calculator is still in Work In Progress (WIP) status.

The calculator must be finalised to enable the credit obligation to be approved. However, we have been able to review the calculator and we provide the following comments.

The FBA calculator has provided information relating to the percentage of remaining vegetation after development for the inner and outer assessment circles. This information shows that there is no change to the percentage of remaining vegetation for the outer assessment circle when the clearing of the development is taken into account. Further justification and data analysis should be provided in the BAR to support this position.

We also note that the connectivity score in the calculator has not been discussed or mapped in the BAR. This is an important assessment consideration which needs to be detailed in the BAR and then reflected in the calculator.

Further information about the above two matters can be accessed by following the FBA and the operational manuals which explain the required information. The applicant should also check Appendix 7 of the FBA which tabulates the minimum requirements for the FBA.

In relation to the number of plots assessed, we note that Table 11 of the BAR indicates that four plots were undertaken for vegetation zone NR 263 Mod/Good. However, the calculator has five plots of data contributing to the calculation of credits for this vegetation zone. This anomaly must be corrected.

BCD Recommendation

1. Further information must be provided in the BAR and calculator in accordance with the FBA and operational manuals.
2. The anomaly in the BAR and FBA calculator regarding the number of plots for vegetation zone NR 263 Mod/Good must be corrected.

Avoiding impacts

We note that the proposed development site is in a biodiversity sensitive area and a biodiversity corridor which provides habitat for many threatened species including the koala.

The current development footprint will impact on these biodiversity values. The BCD considers that the biodiversity impacts should be reduced to limit the area of biodiversity impact for the proposal. In our previous letter dated 3 April 2020 we also identified that further avoid and minimise options should be considered. The requirements to avoid and minimise impacts on biodiversity values are detailed in section 8 of the FBA.

The BCD does not support the level of biodiversity impacts currently proposed.

BCD Recommendation

3. Further avoidance of impacts on biodiversity values should be incorporated into the proposed development.

Koala impacts

We understand that based on the current survey results and modelled activity levels, combined with previous Koala survey results, and the widespread occurrence of several Koala feed trees within the forested parts of the site, the site is considered to be habitat for the Koala, as a species credit species under the Framework for Biodiversity Assessment.

The Koala Survey and Assessment report dated December 2020 identifies that:

'The total area of Koala habitat within the site is estimated to be around 42.6 hectares. The removal of Koala habitat associated with the proposed expansion of the Sancrox Quarry will reduce the availability of foraging and breeding habitat for the local Koala population and will increase barriers to local movement and dispersal of Koalas in the locality, particularly in a north-south direction.'

This large impact to koala habitat is not acceptable to the BCD, particularly as this is likely to reduce the effectiveness of the NSW Government's Saving Our Species (SOS) program for the koala and the NSW Koala Strategy. These two NSW government initiatives aim to stabilise and increase koala populations across NSW.

We also note that the locality of this proposed development is in an area where the recent bushfires did not impact the native vegetation. However large areas further East and South of the subject site have had bushfires affect native vegetation including areas of koala habitat. Areas of koala habitat that have not been affected by bushfires are even more important in the landscape to provide suitable refuge and corridor movement while the bushfire impacted areas recover. Retaining large connected vegetated areas in the landscape contributes to the resilience of the local koala populations.

BCD Recommendation

4. Further avoid and mitigate options need to be considered as part of the proposal to reduce the impact on koalas, their habitat, and their movement corridors.

Indirect Impacts

The adequate consideration of indirect impacts is a matter which we have raised in our previous two letters (3 April 2020 and 11 December 2019).

Section 5.4 of the BAR identifies the indirect impacts of the proposal. Although acknowledging that indirect impacts are likely to occur from the proposal, the BAR also goes on to indicate, very broadly, that these indirect impacts will be minimal as indicated in the text below from page 55 of the BAR.

'The post-mitigation measures ensures minimal light and noise impact on flora and fauna species. The revised Biodiversity Assessment Report includes further assessment of edge effects, concluding that edge effects are unlikely to adversely affect local populations of native flora and fauna, and that there are not likely to be any threatened species affected by edge effects, as no such species are likely to be inhabiting the fringes of the proposed pit footprint, or rely on those areas for their breeding or other life cycle processes'.

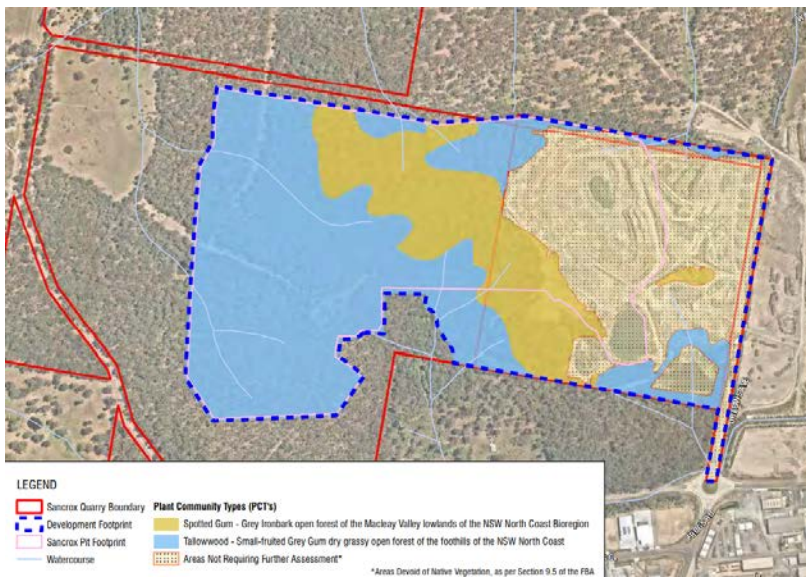
Although the BAR has described some mitigation measures to address indirect impacts, it is still not clear where these mitigation measures, such as weed control, are proposed to be undertaken. For instance, is weed control only limited to the development footprint, or within a nominated distance from the development footprint, or is weed control proposed for the whole of the site? The adequate evaluation of the mitigation measures requires more detail to be provided.

As described in detail in our previous correspondence dated 11 December 2019, there are likely to be indirect impacts on the retained vegetation which cannot be fully addressed by mitigation measures. These remaining impacts can be offset as described in our previous letter. Further, the

Biodiversity Assessment Method (BAM) operational manual stage 2 (page 18) describes in detail how offsetting indirect impacts can be undertaken.

We note that the revised proposal has avoided direct impacts to the previously identified Endangered Ecological Community (EEC). The indirect impacts to this EEC still need to be considered. The revised BAR does not show the location of this EEC and its relationship to the proposed development footprint. The potential indirect impacts on the EEC need to be described within the BAR.

We also note that the proposed development footprint is located on the southern boundary of the subject site and provides no buffer to that property. The biodiversity values of the adjoining property are likely to be similar to those described in the BAR for the proposal. The potential indirect impacts of the proposed development on the biodiversity values of the property to the south need to be considered as part of the BAR. The proposed development footprint as shown in the BAR is detailed below.



BCD Recommendation

5. The indirect impacts of the development have not been considered in accordance with the FBA and further information and justification is required.



Our Ref: DOC21/803704
Your Ref: SSD-7293

Planning and Assessment Group
Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Attention: Ms Melissa Anderson

Dear Ms Anderson

RE: Clarification of BCD advice - Sancrox Quarry Expansion Project (SSD-7293)

Thank you for meeting with the Biodiversity and Conservation Division (BCD) of the Department of Planning, Industry and Environment on 8 September 2021. The meeting was useful to discuss the recommendations stated in our letter to the Planning and Assessment Group (PAG) dated 23 June 2021 and the teleconference that we had with representatives from Hanson Construction Materials Pty Ltd (Hanson) on 3 September 2021.

As discussed with you and Hanson, the current proposal for the Sancrox quarry to expand would impact on a large area of land with high biodiversity values. The proposed impact area includes known habitat for the koala, and several other threatened species, and has biodiversity value as part of a broader wildlife corridor.

We have been involved with the assessment of this proposal since 2015 and during this time, we have consistently advised that more avoidance of biodiversity impacts needs to be incorporated. Whilst we understand that the latest version of the quarry expansion proposal has reduced the development footprint by a few hectares, the impact area is still approximately 40 hectares.

This reduction does not satisfactorily address our recommendations for adequate avoidance to be incorporated. A substantial reduction of the development footprint is required with justification to demonstrate that the proposal has sufficiently avoided impacts on biodiversity and habitat connectivity consistent with the Framework for Biodiversity Assessment.

We would be happy for you to provide this letter to the proponent as further clarification of our position. If you have any questions about this advice, please do not hesitate to contact Mr Krister Waern, Senior Operations Officer, at krister.waern@environment.nsw.gov.au or 6640 2503.

Yours sincerely

A handwritten signature in blue ink that reads 'Dimitri Young'.

16 September 2021

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Biodiversity and Conservation

APPENDIX C

SLR Response Letter to BCD Issues

1 March 2022

630.11478-L01-v1.0-SLR response to BCD-Avoidance-20220301.docx

Hanson Construction Materials Pty Ltd
PARRAMATTA NSW 2124

Attention: Belinda Pignone

Dear Belinda

Sancrox Quarry Expansion (SSD7293) Biodiversity Assessment Report (BAR) Response to BCD - Avoidance Measures

1 Introduction

This letter is provided in response to clarification advice received from the Biodiversity Conservation Division ('BCD') regarding their position on the proposed Sancrox Quarry expansion project (the 'project') in their letter dated 16 September, as well as their previous submission on the Biodiversity Assessment Report (BAR), as per letter dated 23 June 2021.

This letter addresses the most recent clarification advice, which relates primarily to 'avoidance' measures applied to the pit design and 'connectivity' impacts in reference to the requirements under the NSW *Framework for Biodiversity Assessment* (FBA), as well as the comments in the previous submission related to avoidance measures. The latest (September 2021) letter from the BCD states, "the current proposal for the Sancrox quarry to expand would impact on a large area of land with high biodiversity values" and that a "substantial reduction of the development footprint is required with justification to demonstrate that the proposal has sufficiently avoided impacts on biodiversity and habitat connectivity consistent with the Framework for Biodiversity Assessment".

2 Revised Pit Design

The layout of the proposed quarry has been modified (by Hanson, the proponent) since the Response to Submissions (RTS). In response to feedback received during the EIS exhibition and RTS phases, the pit surface extent (including ancillary infrastructure) has been reduced from around 60.6 hectares (ha)(as exhibited in the EIS) to 49.9 ha (as it is now currently proposed), a reduction of around 10.7 ha¹. This has reduced the total area of vegetation removal associated with the proposed quarry expansion to around 30.4 ha, compared to 43.1 ha as originally exhibited in the EIS² – a reduction of approximately 12.7 ha (or 30 % of the original area). The current proposed pit layout is shown in **Figure 1**.

A comparison of the potential direct impacts on biodiversity, both in terms of calculated vegetation removal (using GIS) and in biodiversity credits (calculated using the FBA Calculator), including the reductions achieved in the quarry footprint, vegetation removal and biodiversity credit requirements, is listed in **Table 1**.

¹ The pit extent area proposed in the Response to Submissions was 57.55 ha

² The area of vegetation removal calculated in the Response to Submissions was 39.02 ha.

Table 1 Comparison of Quarry Footprint and Vegetation Removal from EIS to post-RTS

Project Component	EIS (BAR) Biodiversity Impacts	RTS Biodiversity Impacts (% reduction)	Final Project Biodiversity Impacts (% reduction)	Overall Reduction of Project Biodiversity Impacts (% reduction)
Total quarry footprint	60.60 ha	57.55 ha (5 %)	49.90 ha (13 %)	10.70 ha (17.6%)
Total area of vegetation removal	43.10 ha	39.02 ha (9.5 %)	30.40 ha (22 %)	12.70 ha (30 %)
Biodiversity credits required for offsetting	2449 ecosystem credits	2,230 ecosystem credits (219 less credits) 1,026 Koala credits (new credits)	1,526 vegetation credits (704 less credits) 703 Koala credits (323 less credits)	923 ecosystem credits (37.7 %) 323 Koala credits (32 %)

Importantly, the proposed pit expansion works would be carried out in stages, with portions of each stage to be cleared annually over several years.

- Stage 1: 1-10 years
- Stage 2: 10-20 years
- Stage 3: 20-30 years

The main pit expansion stages are shown in **Figure 2**.

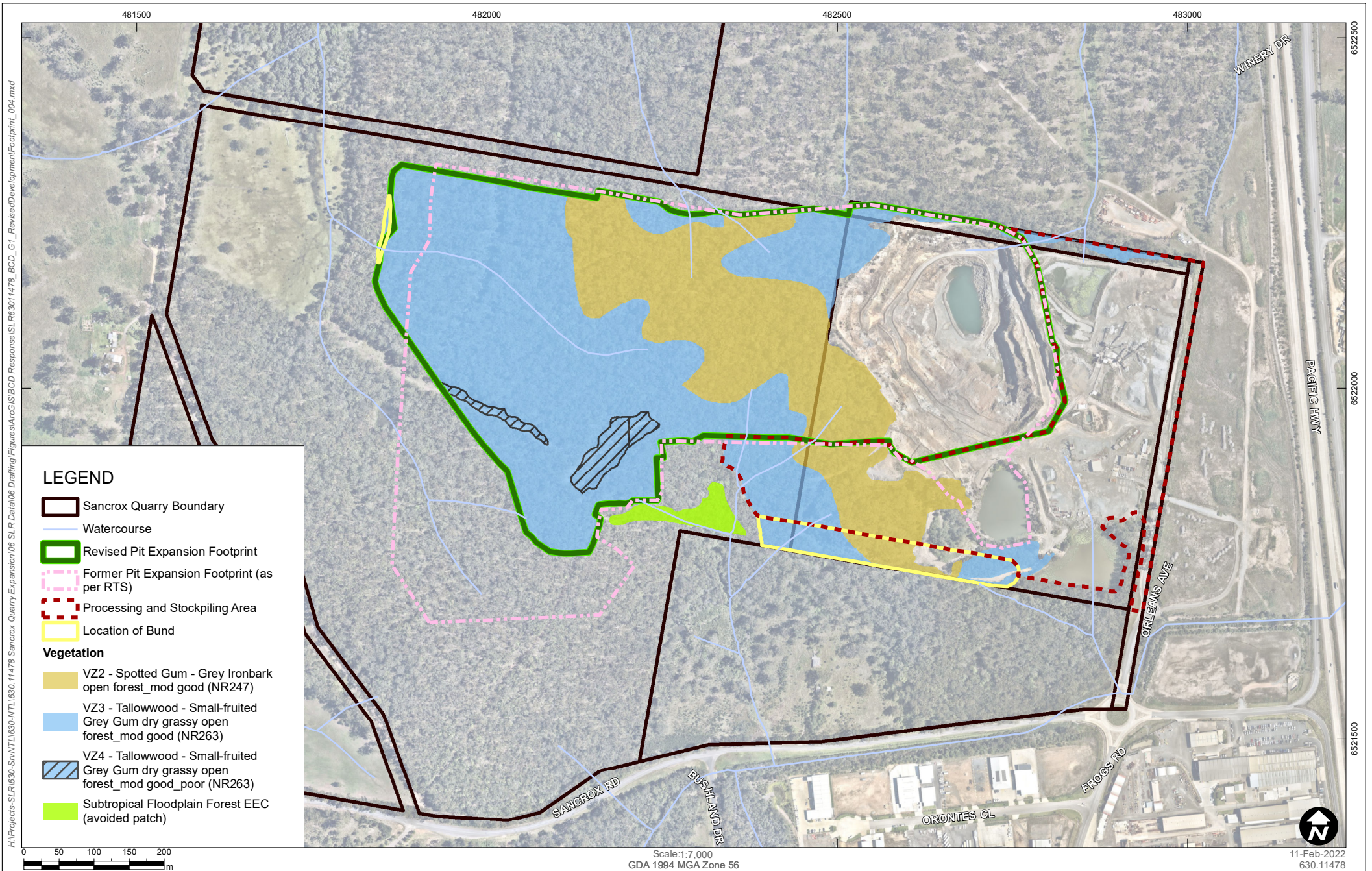
3 Avoidance Measures

The FBA requires that the proponent and the BioBanking assessor consider whether biodiversity impacts of a Major Project can be avoided or minimised. The proponent must incorporate the principles of avoiding and minimising impacts to biodiversity into the entire life cycle of the Major Project in accordance with the guidelines in Subsection 8.3.2 of the FBA.

Avoidance measures proposed as part of the project are described in Section 5.1 of the Biodiversity Assessment Report (BAR) for the project. The section describes the considerations in both (i) site selection and (ii) optimising the layout of the proposed quarry pit.

Measures proposed to avoid and minimise disturbance of native vegetations communities are described in Section 5.1 of the BAR and are as follows:

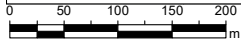
- Redesign of pit to avoid or minimise disturbance to high value vegetation (ie threatened ecological communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act). In this case, the pit layout was modified along its southern boundary to avoid clearing of the existing patch of Subtropical Coastal Floodplain Forest EEC (PCT 686, or NR 117).



H:\Projects\SLR\630-SwMTL\630-WTL\630-11478 Sancrox Quarry Expansion\06 SLR Data\06 Drafting\Figures\ArcGIS\BDCD Response\SLR63011478_BCD_G1_RevisedDevelopmentFootprint_004.mxd

LEGEND

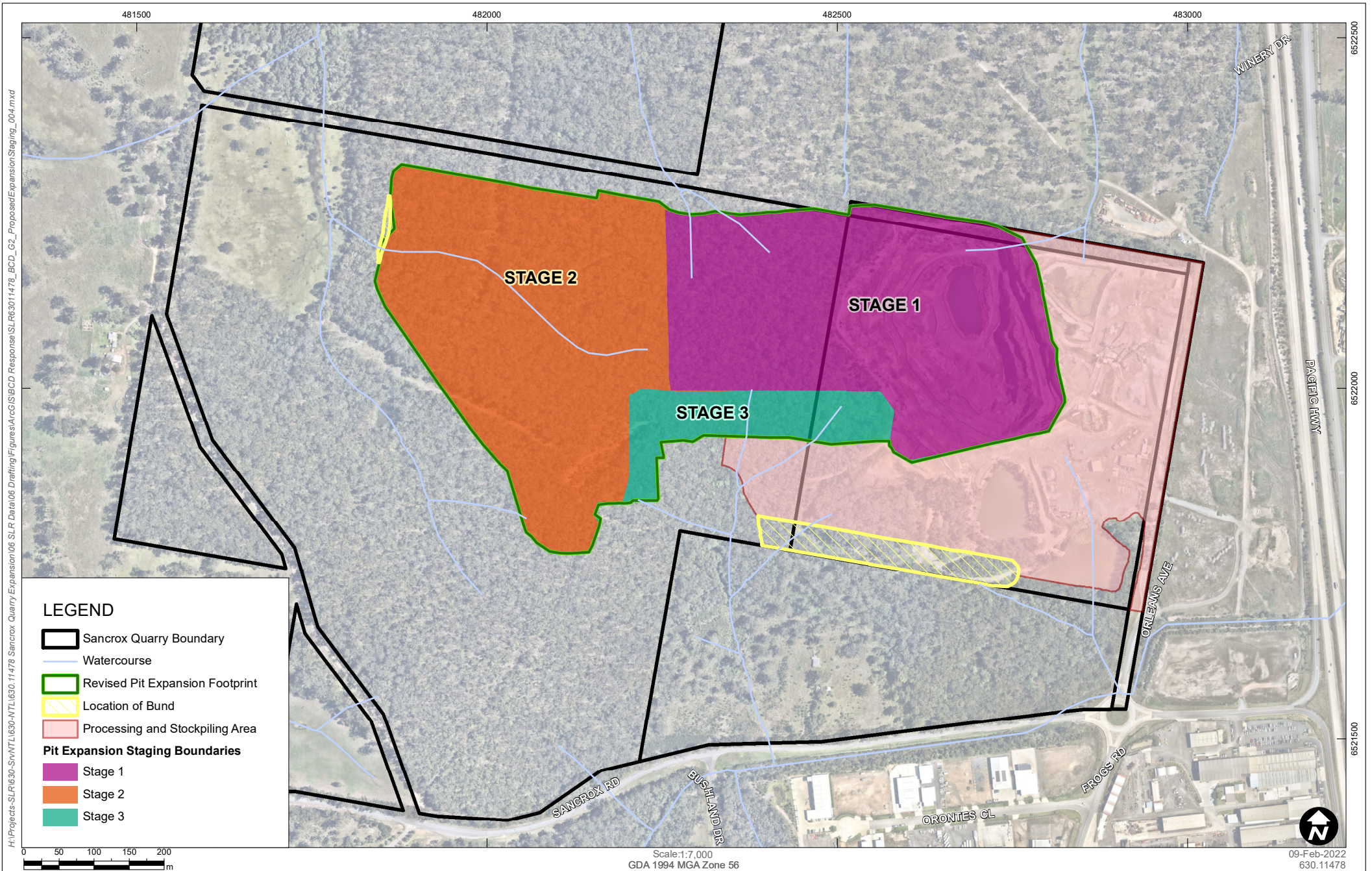
- Sancrox Quarry Boundary
- Watercourse
- Revised Pit Expansion Footprint
- Former Pit Expansion Footprint (as per RTS)
- Processing and Stockpiling Area
- Location of Bund
- Vegetation**
- VZ2 - Spotted Gum - Grey Ironbark open forest_mod good (NR247)
- VZ3 - Tallowood - Small-fruited Grey Gum dry grassy open forest_mod good (NR263)
- VZ4 - Tallowood - Small-fruited Grey Gum dry grassy open forest_mod good_poor (NR263)
- Subtropical Floodplain Forest EEC (avoided patch)



Scale: 1:7,000
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- Reduction in the development footprint from 60.60 hectares to 49.9 ha. This area was refined based on geological and ecological constraints, and in response to feedback received during the RTS and EIS exhibition.
- The impact area was refined to minimise net impacts on biodiversity values (native vegetation and fauna habitats).

With respect to optimising the layout of the proposed quarry pit, the following is also noted in Section 5.1 of the BAR:

- The proposed pit expansion is required to be located adjacent and contiguous with the existing pit and associated infrastructure, due to the location of the geological resource, so there is no real possibility of locating the proposed pit to another location within the site (or beyond the site).
- The western boundary of the quarry has been reshaped (to approximate the lot boundary) and pulled to the east, reducing potential 'edge effects' and ensuring that there is as much vegetation as possible for north-south connectivity for Koala and other fauna to move around the existing and proposed quarry pits.

With regard to guidelines for avoidance measures in Subsection 8.3.2 of the FBA, the FBA guidelines have been followed in the design of the Sancrox Quarry Expansion Project and this is demonstrated in Section 5.1 of the BAR.

Importantly, the residual impacts on biodiversity values that could not be avoided in the design of the project have been offset using credit calculations completed according to Section 8 of the FBA. The biodiversity credits required to offset the project (were detailed in Section 6.5 of the BAR) have been re-calculated using the FBA Calculator. A total of 1,701 ecosystem credits and 789 species credits for the Koala would be required to offset the clearing of native vegetation as part of the proposed development.

Additionally, the proposed quarry expansion is to be staged, with associated vegetation clearing to be completed progressively over several decades (as noted above). This means the impacts on flora and fauna across the development footprint will be progressive and will allow time for mobile fauna species to disperse from the impact area over time and relocate prior to impacts arising from later stages of clearing.

We note that the proponent (Hanson) has, subsequent to the previously submitted BAR and RTS, further avoided biodiversity impacts by reducing the extent of the quarry footprint to 49.9 ha, a reduction of approximately 10 ha, reducing clearing of native forest vegetation (PCT 1262) by a similar amount. Taken with the previously described avoidance measures, in particular around 56 % of the Sancrox property³ is being set aside for retention and protection of existing vegetation or revegetation, this demonstrates a clear commitment to achieve a sufficient avoidance outcome consistent with the FBA.

As part of the quarry expansion, Hanson are also proposing to revegetate cleared grazing land within the wider Hanson owned property. Around 17.1 ha of cleared grazing land occupies the western parts of the site (west of the proposed expansion pit) and across most of the proposed offset site in the northern lot (Lot 2 DP 574308). Proposed revegetation areas are shown in **Figure 3**. Revegetation of these cleared grazing lands will, over time, widen the post-development connecting link (of contiguous woody PCTs) around the western side of the site, and improve the connectivity of habitat for the Koala and a range of other mobile native fauna species. Proposed revegetation works will commence after approval and will therefore be well established prior to impacts associated with later stages of the quarry occurring.

³ Refers to the combined Hanson-owned lots that make up the Sancrox Quarry property, being the existing quarry site on Lot 353 DP 754434, Lot 1 DP720807 and Lot 1 DP 704890 and expansion site on Lot 2 DP 574308.

Additionally, what constitutes an acceptable (or 'sufficient') level of avoidance (of impacts on biodiversity values) is not defined in the FBA. Conversely, in their submissions on the Sancrox Quarry Expansion project, the BCD have not defined what they consider to be 'sufficient' avoidance of biodiversity impacts. Consequently, the BCD statement (in their September letter) that the proponent must "...demonstrate that the proposal has sufficiently avoided impacts on biodiversity..." is meaningless and impossible to respond to, as the BCD have not provided any guidance as to what they consider to be a 'sufficient' level of avoidance. It is Hanson's position that the avoidance measures as listed below demonstrate a clear commitment to achieve a sufficient avoidance outcome consistent with FBA. Given that the proposal provides a very specific set of circumstances and parameters it is incumbent on BCD to provide specific guidance as to what would constitute sufficient avoidance, if they remain of the opinion that the avoidance measures taken to date are insufficient.

In terms of avoidance measures across the entire Sancrox Quarry site, the following areas are relevant:

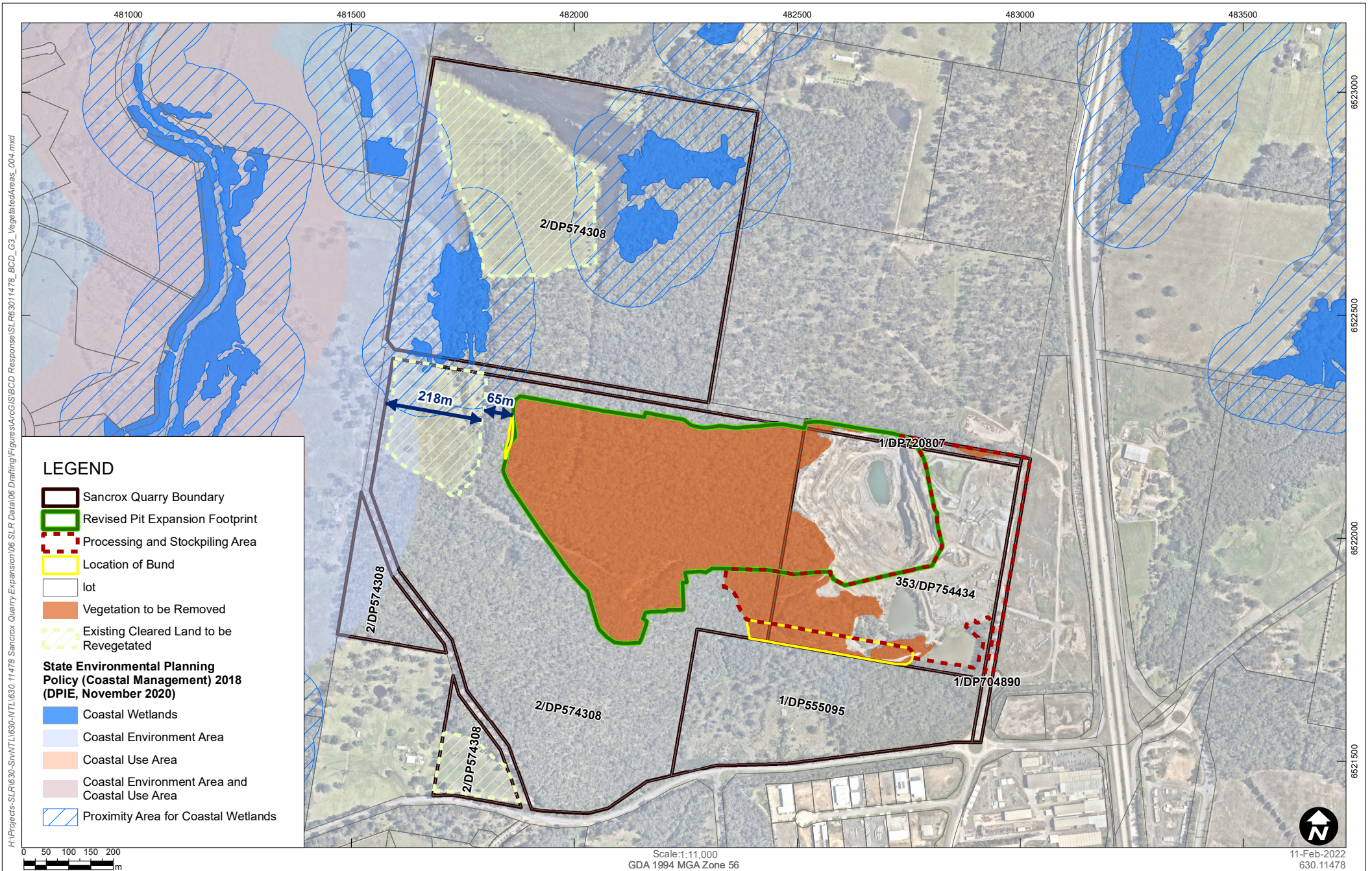
- Total Sancrox property¹ = 145.4 ha
- Total area of vegetation removal = 30.4 ha
- Total vegetation retained on-site = 63.9 ha
- Total land currently cleared to be revegetated = 17.1 ha

This means that around 81 ha of the entire 145.4 ha Hanson property is now proposed to be retained or revegetated for biodiversity values, equivalent to 56 % of the total area. This represents a very significant proportion of the site from which biodiversity impacts have been avoided or will be protected and/or improved. Vegetation to be cleared, existing forest vegetation to be retained and lands proposed for revegetation, are shown in **Figure 3**.

It is highlighted that even the EIS quarry extent already incorporated a significant level of avoidance, by way of a significant proportion of the Hanson property being retained and revegetated for biodiversity values. In particular, the quarry extent in the exhibited EIS was approximately 60.6 ha, with approximately 43.1 ha of vegetation removal proposed – which allowed for almost 50 % of the Hanson property (including forest vegetation present) to be retained and/or rehabilitated – demonstrating significant commitment to avoid impacts at the time of the original EIS exhibition.

In designing for the avoidance of these impacts, Hanson has made further meaningful and substantive reductions in the scale of the quarry and its associated impacts since the EIS exhibited, including:

- 30.4 ha of vegetation clearing in total (staged over several years) – a reduction of around 30 % from the original estimate in the BAR. This means that around 56 % of the Sancrox property will be retained, with this area supporting a combination of currently forested lands and currently cleared lands that are proposed to be revegetated to improve biodiversity values and provide future Koala habitat.
- The western limit of the proposed pit, through several design iterations, has been retracted eastwards, thereby reducing the quantum of clearing of native vegetation and retaining a greater width of connecting link in a north-south direction through the western parts of the site (further details are provided below).
- A reduction in the proposed annual operational output, from 750,000 tonnes per annum down to 530,000 tpa – a reduction in capacity of approximately 30 %.
- A reduction of more than 14M tonnes of quarry resource.



4 Connectivity of Habitat

4.1 General

Connectivity of habitat is discussed in Section 2.9.2 of the BAR. In their September letter, the BCD argue that impacts on 'biodiversity and habitat connectivity' must be reduced and justified "consistent with the Framework for Biodiversity Assessment". In this regard, we note that the habitat connectivity assessment in the BAR was completed in accordance with the methods outlined in Appendix 4 of the FBA.

Importantly, no State or regional biodiversity links occur within the Development Site, as discussed in Section 2.8 of the BAR; although it is noted that the site is mapped as a portion of a "sub-regional biodiversity corridor"; the study area and surrounding lands are mapped as "high priority koala habitat" and there is a small portion of "medium-high priority biodiversity area" within the proposed Development Site.

In terms of connectivity of habitat beyond the immediate surrounds of the site, Sancrox Road forms the southern boundary of the site and is somewhat of a natural barrier to ground fauna movement. Cleared grassland (i.e. largely treeless grazing pasture) occurs in the western parts of the site, and is widespread beyond the site to the west and north; the Sancrox Industrial Estate forms a barrier to fauna movement to immediate southeast (and east and north east) of the site; recently cleared land adjoins the site to the east and the Pacific Motorway forms a hostile barrier to ground fauna (including Koala) movement to the east of the site. The site forms part of a north-south link that does not extend in any meaningful way north of the site, where it gives way almost immediately to cleared pasture that extends further north to the Hastings River.

Canopy vegetation visible in aerial imagery extends south, although fragmented and partially cleared for small rural holdings, whilst contiguous canopy extends in a southwesterly direction from Sancrox Road. Importantly however, the corridor to the south is also constrained in terms of a minimum width immediately south of Sancrox Road, reducing to around 300 m in width. So, whilst there is contiguous canopy further to the south / southwest of the quarry site, the connecting link is constrained by a 300 m wide pinch point immediately south of Sancrox Road (see **Attachment A**). Further, more than half of this 300 m corridor is located on small rural holdings, and so whilst it appears to be vegetated, the protection of this vegetation not secure and the connectivity values are to some degree compromised – as such, less than 150 m of protected canopy vegetation is available through this pinch point.

4.2 FBA Connectivity Assessment (as per submitted BAR)

The assessment of 'connectivity value' (as provided in the BAR) for the Sancrox Quarry Expansion project is detailed below in accordance with the steps under Appendix 4 of the FBA.

Step 1 Identify the Connecting Links

To complete the connectivity assessment, contiguous canopy vegetation across the study area and adjoining lands was mapped using aerial photography (current at the time of the BAR preparation), noting the definition of 'connecting links' in Appendix 4 of the FBA⁴. Inspection of aerial imagery at the time of the assessment revealed that two main links traverse the site, with native forest vegetation extending south and southwest from the site and to the northwest and north of the site (before giving way to cleared agricultural land).

⁴ Native vegetation on the development site is part of a connecting link when it is linked to adjoining vegetation and the native vegetation on the development site:

- is in moderate to good condition, and
- has a patch size >1 ha, and
- is separated by a distance of <100 m (or <30 m for non-woody ecosystems), and

Step 2 Determine impacts on State or Regional Biodiversity Links

No State or regional biodiversity links occur within the Development Site, as noted in Section 2.8 of the BAR.

Step 3 Determine current (existing) linkage width class

Beyond the northern boundary of the site, both links narrow to just one or two trees amongst cleared agricultural landscapes. (Notably, the limiting width can occur on or off the site). The limiting width and the associated linkage width class for one link was therefore assigned to 'Very narrow' (0-5 m wide). However, the linkage width class for the other link was conservatively chosen as >100 m-500 m ('wide') to acknowledge the fact that the current canopy cover across the site is around 500 m at its widest and that the limiting width occurs off the site.

Step 4 Determine future linkage width class

Removal of the native canopy vegetation as a result of the proposed development would reduce the width of the tree canopy in the primary north-south link (within the site) to around 65 m just to the west of the proposed pit extent. This north-south link is retained under the current plans as a result of the modification to the pit layout to bring the western margin of the pit further east, thereby reducing the clearing of canopy trees in the western parts of the site (see maps in **Attachment A**). A corridor of around 65 m wide will be retained on the western side of the proposed pit, with a further 218 m of cleared grazing land adjoining this to be revegetated (as shown in **Figure 3**). However, we have conservatively assigned the future linkage width class of that link to >30 m-100 m. The future width of the other main link was assigned to 'very narrow' (0-5 m).

Step 5 Determine number of linkage width classes crossed

The number of linkage width classes crossed as a result of the impact of the proposed development on the primary north-south link is '1' one (changing from >100 m-500 m to >30 m-100 m) and for the other north-south link is '0' zero (i.e. no change in linkage width class, being 0-5 m before and after the development). The connecting links mapped across the site as part of this exercise are provided in **Attachment A**.

Step 6 and Step 7 Determine current and future condition classes

Step 6 requires the current average condition of over-storey vegetation within woody PCTs to be determined for each connecting link identified in Step 1.

The condition of vegetation within the vegetated links is assessed as likely to be within benchmark values for the respective plant community types. Hence linkage condition class (of woody vegetation) within the over-storey (canopy) and mid-storey or groundcover is estimated to be within benchmark before and after the proposed development (i.e. 'PFC at BM' and 'PFC of mid-storey/ groundcover at BM' chosen in the Credit Calculator). Hence no linkage condition classes are crossed (i.e. no change in linkage condition class). The score for linkage condition class is therefore '3' according to the FBA.

It is also important to note that, in choosing condition class, we conservatively assumed that the condition of native woody vegetation within connecting links is relatively good and therefore within 'benchmark' for each respective PCT. This assumption was not verified as part of the BAR, but given the level of disturbance of vegetation within the immediate surrounds and the wider locality (e.g. presence of feral deer, rabbit herbivory, weed invasion, grazing, informal access, etc), a lower condition class could be argued.

-
- is not separated by a large water body, dual carriageway, wider highway or similar hostile link.

Step 8 Determine number of condition classes crossed

As there is no change in condition class within each connecting link, the score for condition class is '0' (zero).

Step 9 Determine connectivity value score

Using the number of linkage width classes crossed (step 5) and the number of condition classes lost (Step 8), the final connectivity value score is calculated. As one linkage width classes was crossed and no condition class thresholds crossed, the final connectivity score (as per Table 14 in Appendix 4 of the FBA) is '2'.

A connectivity score of 2 is relatively low (with 12 the maximum) and reflects the fact that the existing links across the site are all highly variable and narrow to one tree width and/or disappear into cleared grazing land, just beyond the site.

4.3 Overview of Connectivity Issues

The BCD letter (September 2021) refers to connectivity in a general (non-FBA) context, in relation to avoidance of impacts. As such, it is important to note the following with regard to the impacts on connectivity of the proposed quarry expansion:

- The FBA connectivity assessment shows that the proposed development would have a relatively low connectivity score (meaning relatively low impact on connecting links):
 - The main connecting link (or links) is through the site in a north-south direction;
 - There are no substantive east-west links through the site;
 - The Pacific Motorway forms a hostile barrier to fauna movement to the east of the site; the Hastings River forms a barrier to all vegetated links (and associated ground fauna movements) to the west and north of the site;
 - All connecting links identified are widest within the site but all reduce to very narrow (0 – 5 wide) just beyond the site, including to one or zero tree widths on watercourses north of the site
 - The primary north-south link disappears into cleared grazing land almost immediately beyond the northern site boundary, and south of the site, the link is disrupted by Sancrox Road and clearing on small scale rural properties, with a narrow pinch point (~ 300 m width) south of Sancrox Road;
- The western limit of the proposed pit, through several design iterations, has been retracted eastwards, thereby reducing the quantum of clearing of native vegetation and retaining a greater width of connecting link (in a north-south direction through the western parts of the site) – the width of the retained corridor west of the proposed pit will be reduced to 65 m at its narrowest, but this width will be extended to around 283 m wide, when the proposed revegetation area is included; and
- Cleared grazing lands within the western parts of the site and within the proposed offset lot to the north (Lot 2) are to be retained for conservation purposes and revegetated (and/or allowed to regenerate) to their previous forest types, thereby introducing forest vegetation to currently cleared areas and increasing the width of the north-south link in this part of the site – the revegetation (or regeneration) of these parts of the site will be established well in advance of the clearing impacts occurring around the western extent of the quarry pit.

It is also worth noting that much of the vegetation north east of the site has been approved for clearing as part of an approved industrial subdivision (being Lot 1 DP124543 and Lot 19 DP1191370), further undermining the current connectivity values of the north-south corridor through Sancrox.

In summary, the current connectivity values of the primary north-south link through the site are being largely maintained, thereby avoiding adverse impacts on local flora and fauna dispersal, and on the dispersal of threatened species (including the Koala).

5 Conclusion

This letter addresses comments made by the BCD in their September 2021 letter which criticises the current design of the Sancrox Quarry Expansion project, notably that it does not sufficiently avoid impacts on biodiversity values and requests further avoidance measures and further consideration of connectivity impacts to demonstrate compliance with the FBA.

It is our contention that the BAR has been prepared in accordance with the FBA, and that avoidance measures have been incorporated into the design of the proposed development progressively as part of an iterative design process for the quarry expansion, which is entirely consistent with the process for impact avoidance outlined in the FBA.

In conclusion and in response to the BCD comments:

- The site selection process, pit layout design and associated impact avoidance measures, as described in the BAR, are in accordance with the guidelines provided in Section 8.3.2 of the FBA.
- The FBA does not define an acceptable level of 'avoidance' of impacts on biodiversity values; moreover the BCD have not defined what would constitute a 'sufficient' level of avoidance;
- The current proposed layout of the quarry has been modified since the original concept design in response to biodiversity values identified on site as a result of ecological investigations conducted as part of the preparation of the BAR. As a result, impacts on native forest vegetation and associated connecting habitat for the Koala and other native fauna species have been significantly reduced.
- Avoidance measures built into the design of the quarry expansion and described herein and in the BAR have (i) reduced the quantum of native vegetation clearing, (ii) avoided removal of EEC vegetation and (iii) allowed for retention of a north-south vegetated link (and Koala habitat movement corridor) across the site.
- The connectivity assessment for the Sancrox Quarry Expansion project, as described in the BAR, was completed according to the FBA. The connectivity score for the project is 2, which is relatively low and is a product of the very narrow width of the vegetated links that traverse the site beyond the site boundaries and also of the allowance for retaining connecting canopy vegetation along the western margins of the site (as a results of avoidance measures/pit design changes).

A separate response to other BCD comments on the BAR made in June 2021 as part of the Response to Submissions (RTS) on the EIS will be provided as an Addendum to the BAR.

Yours sincerely

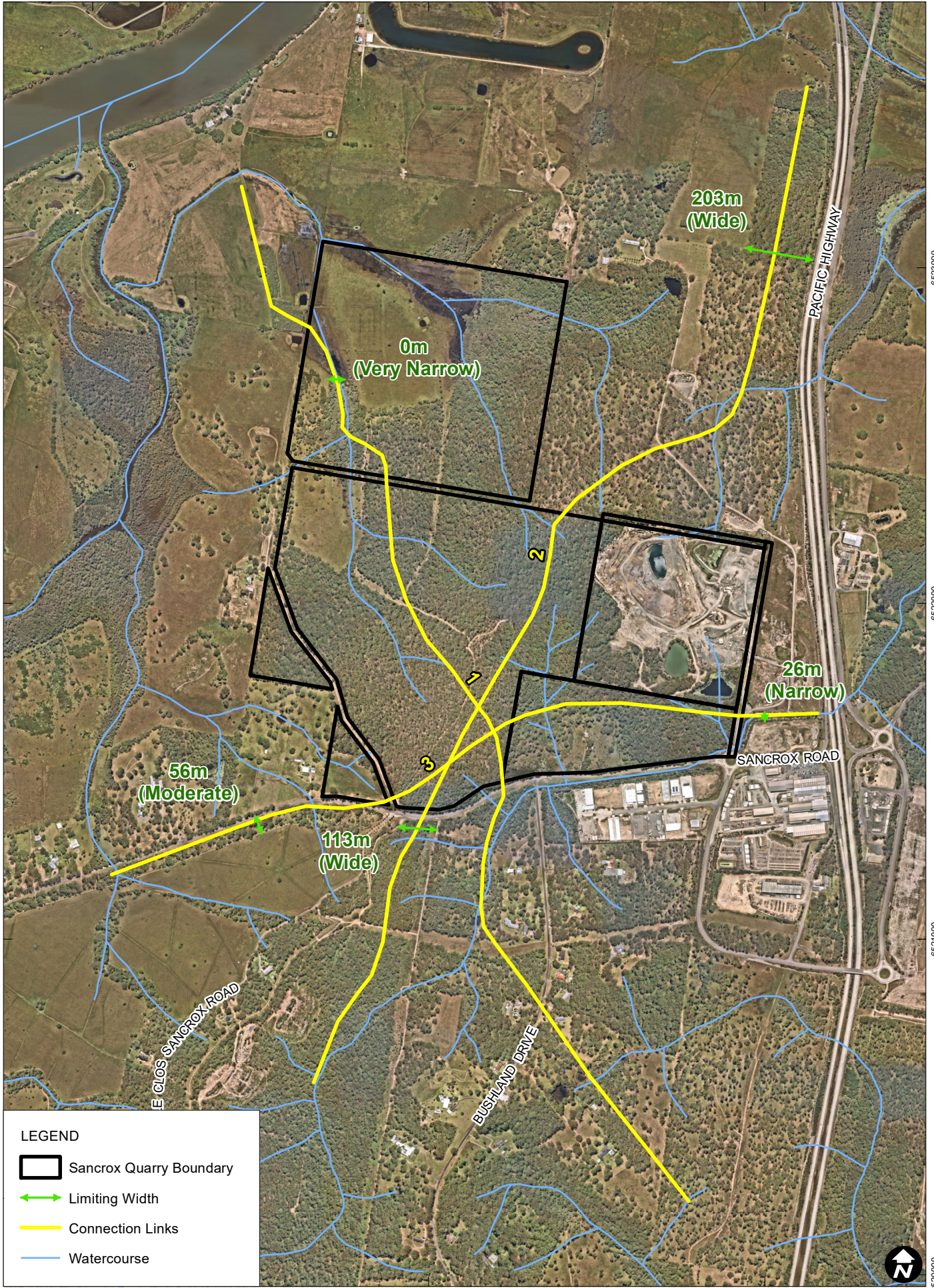


JEREMY PEPPER
Technical Director (Ecology)

Checked/ Authorised by: TW

ATTACHMENT A

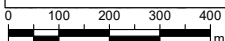
FBA Connectivity Maps



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LEGEND

- Sancrox Quarry Boundary
- Limiting Width
- Connection Links
- Watercourse



Scale: 1:15,000
GDA 1994 MGA Zone 56

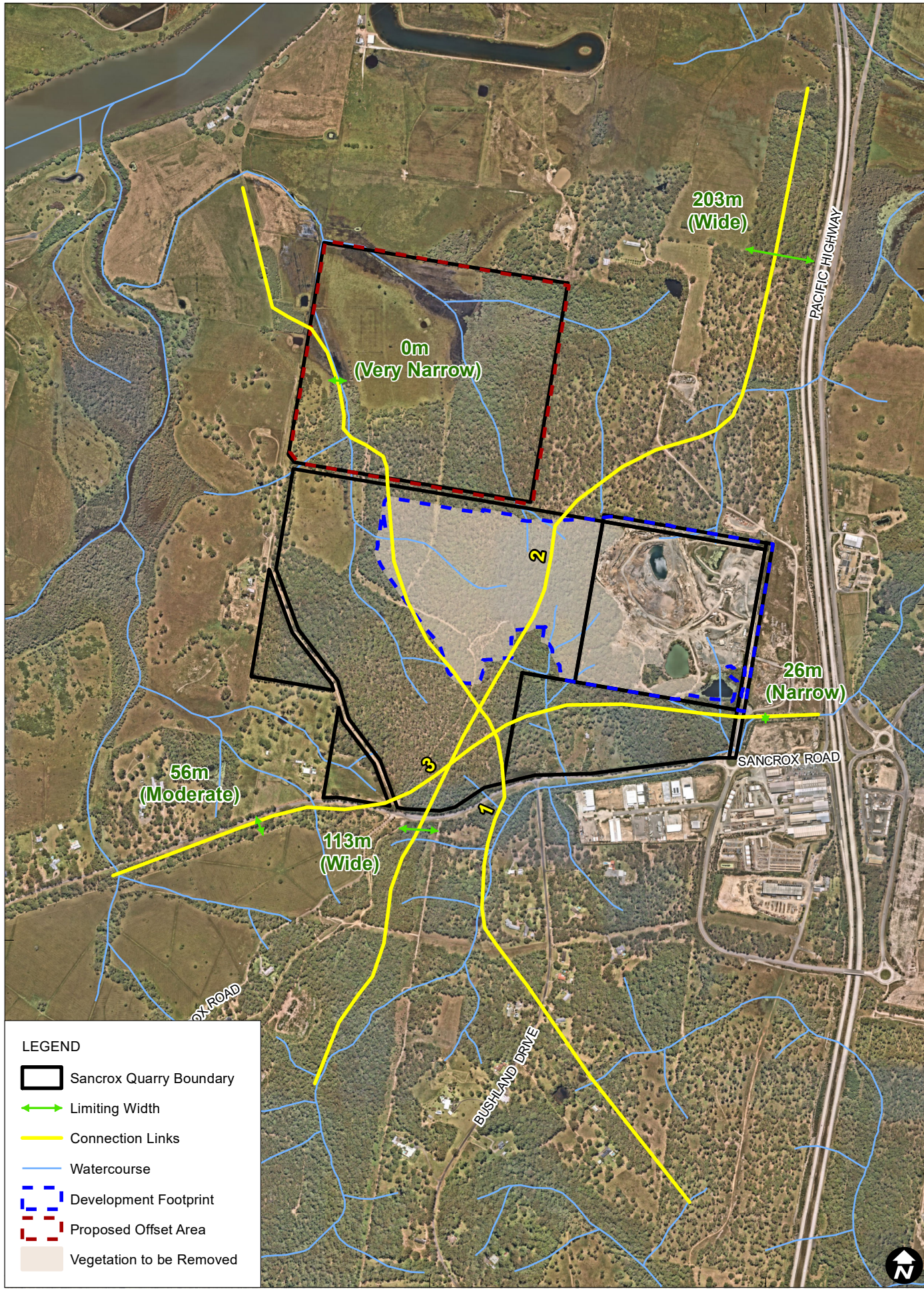
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**Connectivity Value - Pre-Development
Site Connecting Links
(Current linkage widths)**

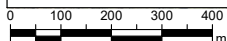
FIGURE A

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LEGEND

- Sancrox Quarry Boundary
- Limiting Width
- Connection Links
- Watercourse
- Development Footprint
- Proposed Offset Area
- Vegetation to be Removed



Scale: 1:15,000
GDA 1994 MGA Zone 56

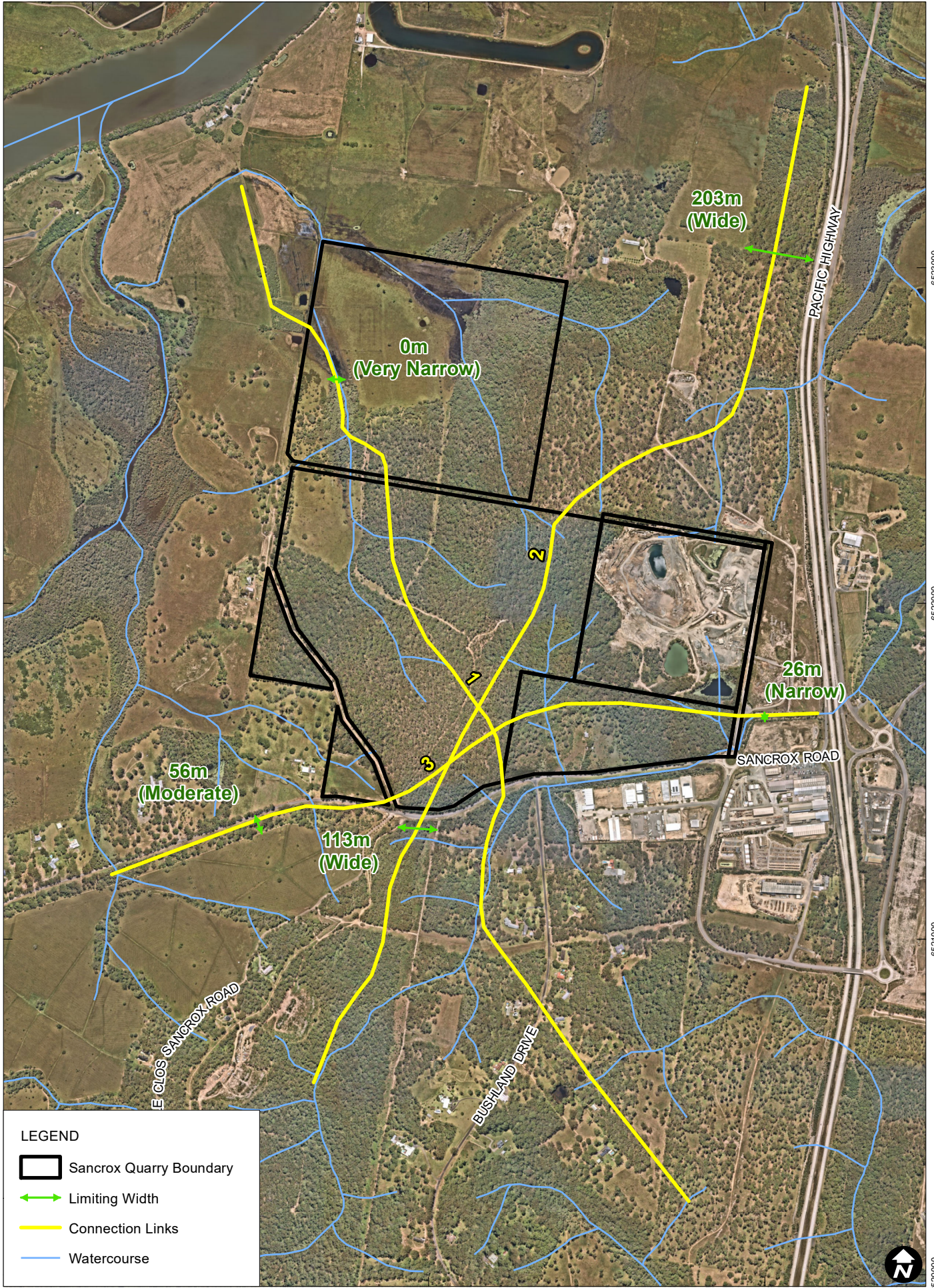
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Connectivity Value - Post Development
Site Connecting Links
(Current linkage widths)

FIGURE B

APPENDIX D

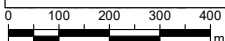
FBA Connectivity Maps



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LEGEND

- Sancrox Quarry Boundary
- Limiting Width
- Connection Links
- Watercourse



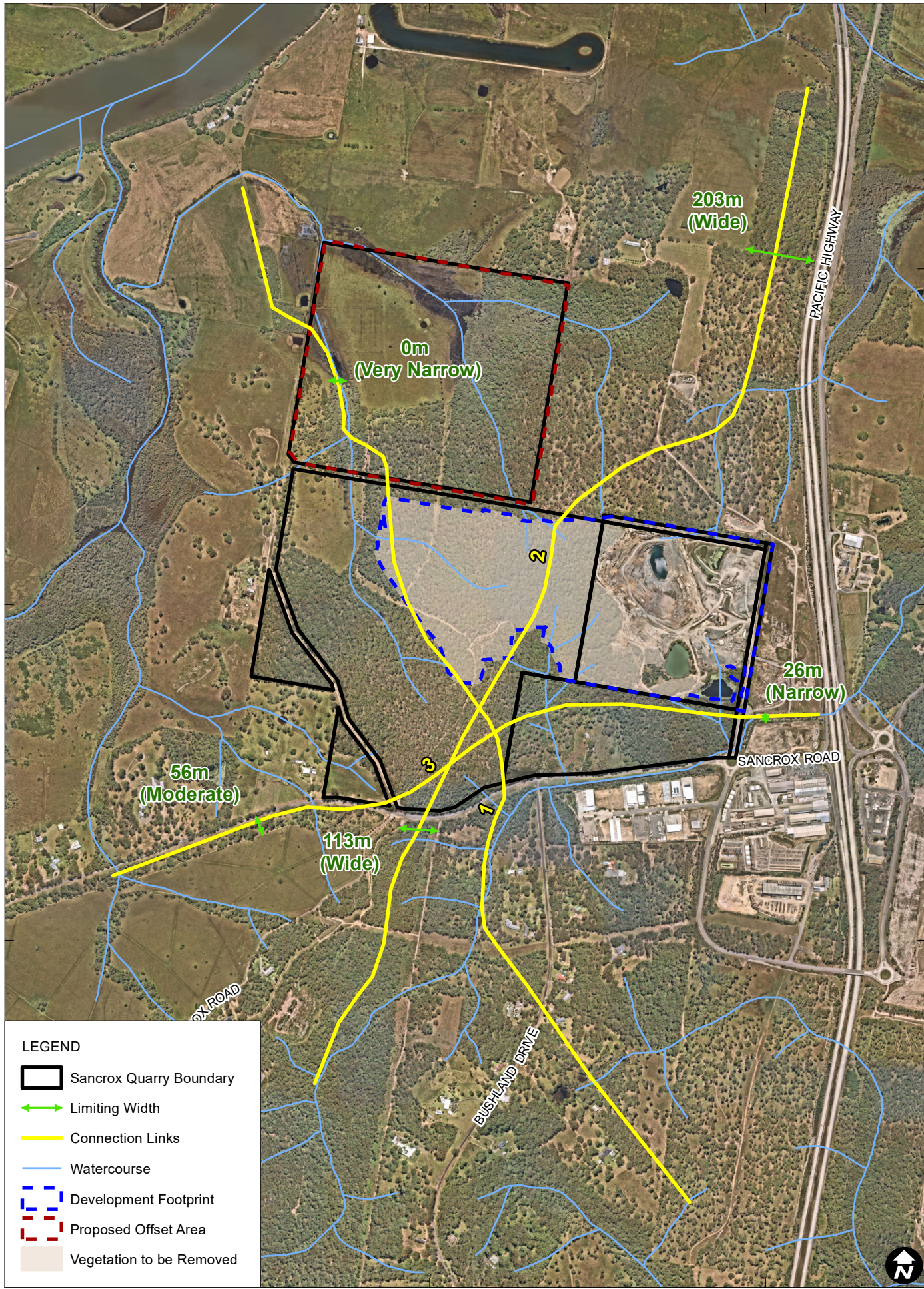
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Connectivity Value - Pre-Development
Site Connecting Links
(Current linkage widths)

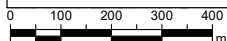
FIGURE A

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LEGEND

- Sancrox Quarry Boundary
- Limiting Width
- Connection Links
- Watercourse
- Development Footprint
- Proposed Offset Area
- Vegetation to be Removed



Scale: 1:15,000
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