Our Ref: 82017142-01 004:SP
Contact: Sophie Perry

12 November 2019

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Attention: Michelle Niles

Dear Michelle,

TALLAWARRA LANDS MIXED USE DEVELOPMENT (MP_09_0131)
MODIFICATION FINAL RESPONSE V2

Background

NOTE: This letter is Version 2 of the final response to submissions. Version 1 was dated 13 September 2019. New information in this Version 2 is provided in italic text to clearly indicate updated information since Version 1.

Introduction

In a letter dated 25 July 2019, the Department of Planning, Industry and Environment (DPIE) requested further consideration of all issues before finalisation of an assessment report on the modification of the Concept Approval for MP09_0131. Contained in Attachment A to the same letter was a list and description of eight (8) key issues.

Cardno and Bridgehill subsequently met with DPIE staff to clarify the content and format of the response expected by DPIE to finalise information for assessment purposes. It was agreed that the final response should be in the form of a letter addressing in detail the eight (8) key issues identified by DPIE and including a table addressing all other issues from the final round of agency consultation.

In order to thoroughly finalise the issues raised from agency submissions and complete final adjustment and refinement to all supporting documents, Cardno and Bridgehill have undertaken the following:

- Clarified future development matters with EnergyAustralia including minor adjustment to Northern and Central super lot boundaries for future acquisition. Specifically the reduction to the extent of the Northern and Central super lot areas has resulted from adjusted acquisition boundaries, noise buffers and response to eight (8) key issues (as explained in detail below)
- Engaged and commenced site investigation works in conjunction with an Independent Site Auditor
- Met directly with Roads and Maritime Services (RMS) to gain in principle support for final information submission and completed revision of traffic and transport information
- *Held teleconference discussions and confirmed by email the resolution of RMS concerns with future noise management for the interface between the Albion Park Rail Bypass and the western edge of the Central Precinct residential lands*
- Met directly with Department of Environment, Energy and Science (formerly OEH) to gain detailed feedback, guidance and shared understanding for the commitment to the necessary ongoing investigations and approvals required to address Aboriginal Archaeology and cultural matters and methods to guarantee long term commitment to the necessary diligence, site management and investigations required to protect Aboriginal heritage

- Addressed matters of bushfire protection through further communication between the appointed Bushfire Consultant and NSW RFS to resolve the acceptable methods for future bushfire protection
- Commenced test excavations, recommenced Aboriginal consultation and commenced preparation of AHIP and an Aboriginal Cultural Heritage Management Plan
- Reviewed and addressed water quality strategies and targets
- Adjusted the conceptual layout and Concept Plan based on all feedback and updated information gained to date
- Prepared a set of recommended modified conditions and Statement of Commitments to accurately match the relevant supporting documents and the anticipated practical roll out of future development.

A response to all issues was submitted to DPIE dated 13 September 2019. After reviewing that response DPIE identified two remaining issues requiring further information. These issues were listed in an email issued by DPIE dated 17 October 2019 as follows:

- *"Heritage – as requested in the Department's letter dated 25 July 2019, archaeological test excavations of the additional urban footprint must be carried out. These test excavations will inform whether it is appropriate to expand the urban footprint and as such, are required prior to determination of the MOD. It is noted that the AHIP and CHMP for future DAs do not correlate with the requirement for the results of the test excavations of the areas of additional urban footprint; and*
- *Traffic – the traffic statement (Appendix E) makes reference to a Revision 8 of the Traffic Impact Assessment (TIA). Please submit a copy of the updated TIA as the last submitted TIA was Revision 4. "*

With regard to the above two issues our response is as follows:

Heritage – In discussions with DPIE, Bridgehill and Cardno on 2 August 2019 it was agreed:

- *There is a clear commitment to complete all necessary consultation, ACHAR and AHIP processes as part of the ongoing Modification and subsequent development applications*
- *The estimated timeframe for completion of archaeological test excavations including the additional urban footprint was 3 to 4 months from the beginning of August 2019*
- *Bridgehill and Cardno to continue providing updates to DPIE on the progress of consultation, preparation of ACHAR and AHIP applications.*

See Section 2 of this letter for more information on the progress of investigations and reporting on Aboriginal Archaeology. Notwithstanding this, there will be no disturbance of the site (including the additional urban footprint in the Northern Precinct) for urban development as a result of this Modification Application or the first superlot subdivision. Therefore an AHIP to destroy items is not required prior to the determination of the Modification Application. The remaining testing and finalisation of an ACHAR is imminent and we request DPIE continue to finalise the assessment of the modification application accordingly.

Traffic – This matter needs clarification. "Revision 8" refers to the (then) most recent revision of the Albion Park Rail Bypass Traffic Impact Assessment (TIA). It does not relate to the TIA prepared by Cardno. The most recent TIA prepared by Cardno to support the Modification application is the Revision contained in Appendix E.1 to this letter.

This letter provides a comprehensive response to the 8 key issues *raised on 25 July 2019 including the two additional issues above* and closes out all outstanding matters from DPIE assessment and agency consultation to the fullest extent possible at this time.

In addition to the two further items raised by DPIE on 17 October 2019, Cardno have followed up further with RMS and DEES. The additional matters resolved with RMS are addressed in Section 5.7 and Appendix E.2. The follow up with DEES is ongoing as the Aboriginal archaeological investigations, consultation and reporting are ongoing as detailed in Section 2 and Appendix D.2.

There are no matters which would prevent DPIE from completing the assessment of the modification and the determination of the application by the Independent Planning Commission.

Included with this letter are:

Appendix A	a set of revised graphics and plans and the final version of the modified Concept Plan where those graphics and plans that are considered by Cardno and Bridgehill as essential to the interpretation of the Concept Plan and conditions

Appendix B	a requested modified set of conditions
Appendix C	a requested modified Statement of Commitments
Appendix D.1	Full page public notice of Notification and Registration of Aboriginal Interest
Appendix D.2	*Tallawarra Lands North Precinct: Aboriginal Cultural Heritage Assessment Draft Report dated 21 October 2019* *Tallawarra Lands North Precinct: Archaeological report* *Draft Report Prepared for Cardno on behalf of Bridgehill Group 3 October 2019*
Appendix E.1	Final Traffic and Transport Analysis and Final response to Traffic and Transport Issues
Appendix E.2	*Email correspondence with Roads and Maritime Services regarding noise impact mitigation and management*
Appendix F	Response to non-key issues raised by agencies from second round of consultation
Appendix G	Email from Peterson Bushfire Consultants
Appendix H	Biosis letter dated 19 October 2018

The following Sections 1 to 8 are detailed responses to the 8 key issues.

1 First Superlot Subdivision

1.1 Superlot Subdivision to facilitate land acquisition

The first superlot subdivision is required to transfer the ownership of land by Bridgehill (Tallawarra) Pty Ltd (Bridgehill) from EnergyAustralia.

At present the entire site is within the ownership of EnergyAustralia.

The previous plan for superlot subdivision referenced in the Concept Approval is shown in Figure 1-1. The proposed plan for the superlot subdivision is shown in **Figure 1-2** and the intended land ownership pattern is **Figure 1-3**.

Figure 1-1 Previous Superlot subdivision layout (Figure 37 from the Environmental Assessment dated February 2011)

Environmental Assessment Report
Tallawarra Lands

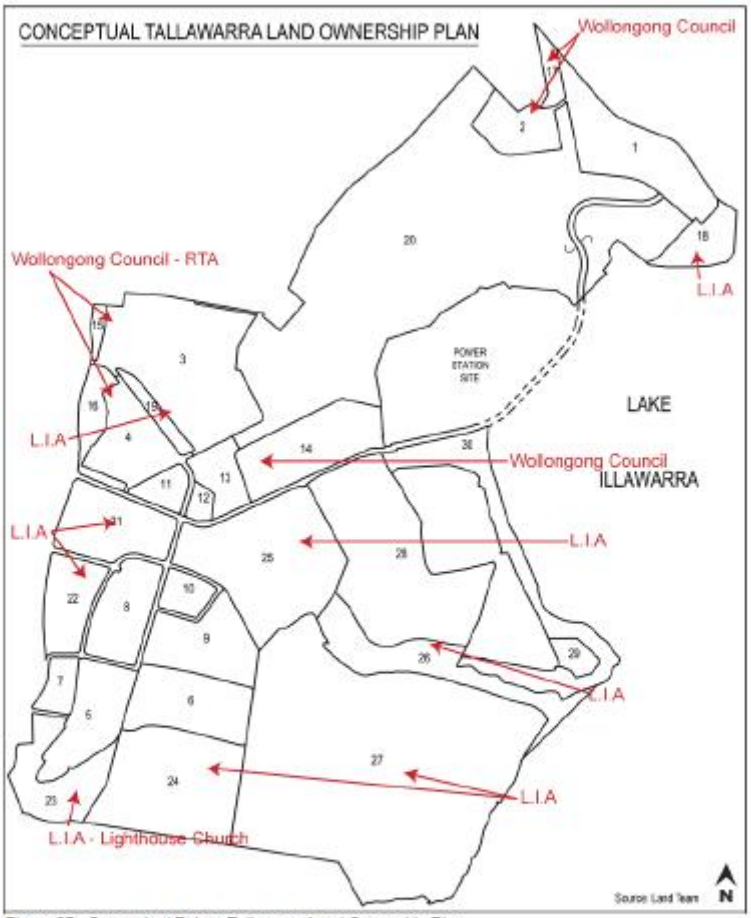


Figure 37: Conceptual Future Tallawarra Land Ownership Plan

Figure 37 has been prepared to illustrate the conceptual future land ownership plan for open space / environmentally sensitive / riparian areas within the site. The proposed superlot subdivision plan has been annotated to indicate which specific parcels could potentially be transferred into the ownership of public authorities / agencies (Council/RTA/Lake Illawarra Authority) subject to future VPA discussions.

Figure 1-2 Proposed Superlot subdivision layout

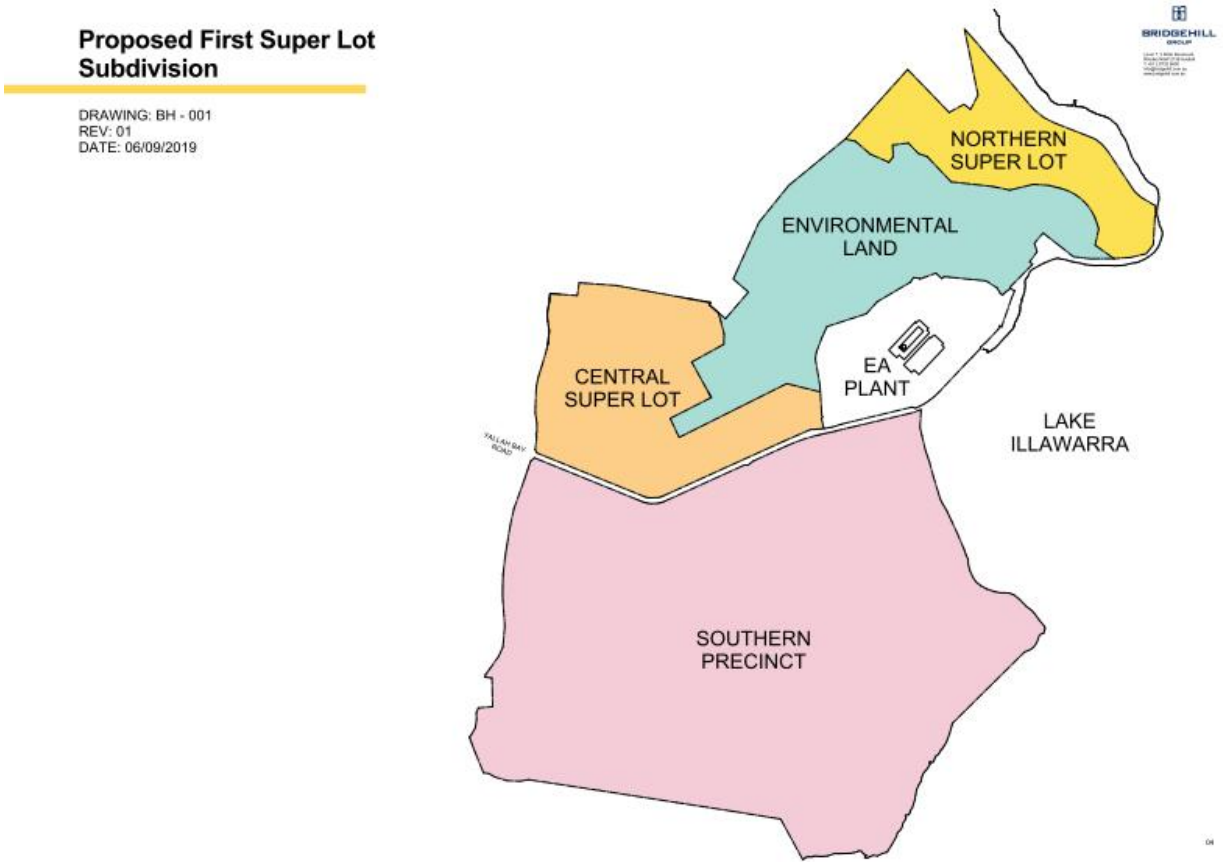
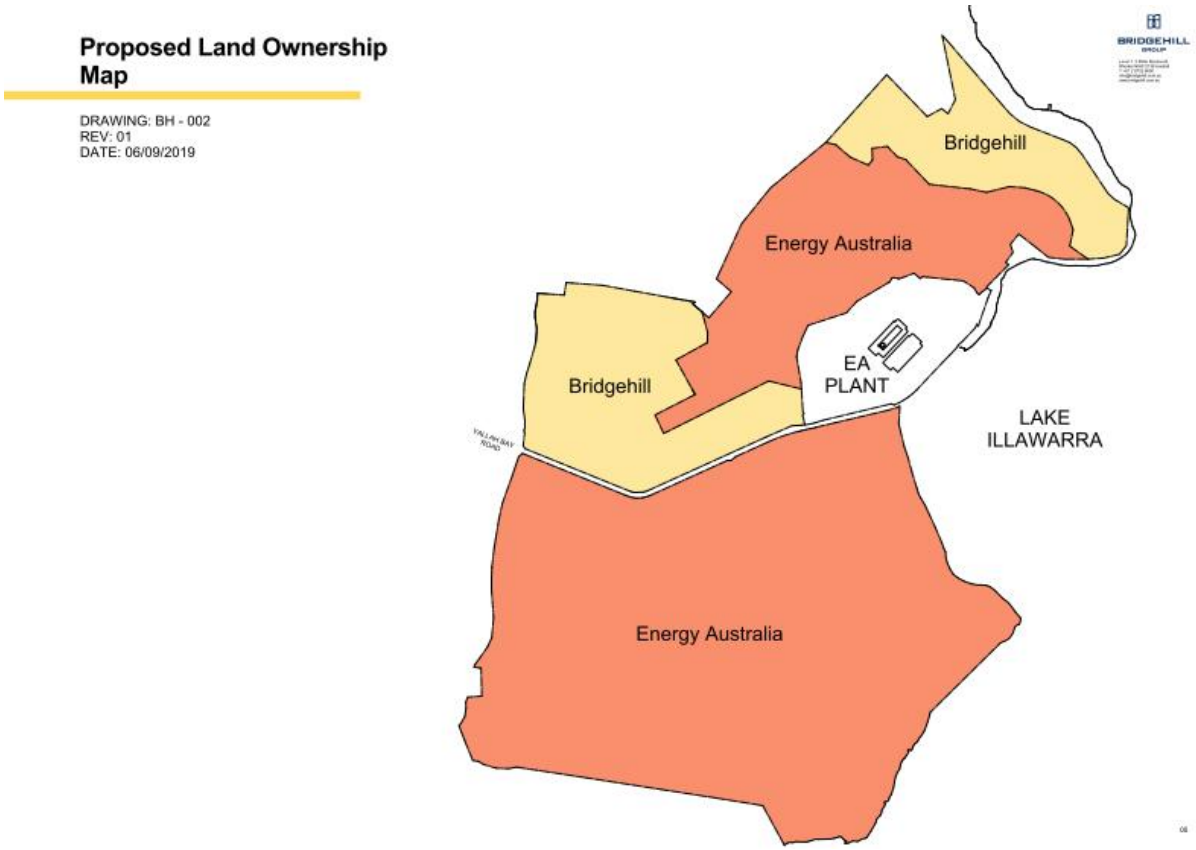


Figure 1-3 Proposed land ownership following superlot subdivision



Bridgehill has an agreement with EnergyAustralia for the development of the Northern and Central super lots (see Figure 1-3). In order to formalise the agreement and transfer the land ownership Bridgehill must create separate legal titles. Energy Australia will retain ownership of the environmental land (shown shaded blue in **Figure 1-2**) as this provides an essential buffer between its power station land and the residential zoned land.

The Northern and Central superlots cannot be created as one title, due to the significant physical separation between these lots (see **Figure 1-2**). Although it is sometimes possible for one legal title to be physically divided (for example by a road or watercourse) this is not an option available when subdividing land completely separated by other lots.

The Registrar-General's Guidelines provide as follows:

> *"A lot should only be separated into two (2) or more physical parts where separated by road, river or other physical feature or where it is necessary to define a complex residue following subdivision of part into other lots. Each part must be designated as such (i.e. 'Part Lot 2') together with separate dimensions and areas for each part and a total area for the lot."*

Because it is not possible to create the central and northern super lots as one legal title, it is proposed to link these two titles by the conditions of concept approval.

The environmental land will never be subject to urban development or a change in use due to its role as a buffer to the power station. It will be permanently managed as environmental lands. Verification of site use suitability under SEPP 55 or satisfactory arrangements for SIC VPA and developer contributions do not apply to the environmental land that forms a buffer to the power station.

Likewise, the power station site will not be subject to verification of site use suitability or satisfactory arrangements for SIC VPA and developer contributions under the concept approval as this land falls outside of the concept approval.It is therefore proposed that the first super lot subdivision would divide the land into super lots as shown in **Figure 1-2** and described as follows:

North of Yallah Bay Road:

1. The northern super lot
2. The environmental land
3. The central super lot

South of Yallah Bay Road:

4. All other land with no change to existing cadastre (to be known as "the Southern Precinct")

The requested modification to conditions of concept approval (Appendix B) and the Statement of Commitments (Appendix C) will ensure that no further subdivision or development can occur on any land until the contamination and satisfactory arrangements conditions are satisfied for both. For further details see Sections 1.3, 1.4 and 1.5 below.

1.2 Superlot Subdivision does not require works or create demands for public facilities and services

The first super lot subdivision will not require works. There will be no road works, no connections or installations related to water supply, sewerage services and drainage, telecommunications or electricity infrastructure.

The draft West Lake State Infrastructure Contribution Draft Determination notice states as follows:

> *"(5) A special infrastructure contribution is not required to be made for development that satisfies both of the following:*
>
> *(a) the development comprises the subdivision of land (other than a strata subdivision or a subdivision that is only for the purpose of a creating a lot to contain an existing habitable dwelling),*
>
> *(b) the Director-General has, having regard to relevant planning controls, certified to the consent authority that each lot resulting from the subdivision is a lot that will be further subdivided in accordance with a further development consent (or approval under Part 3A of the Act) for the purpose of the orderly development of the land for urban purposes in the future.*
>
> *Note. A lot referred to in paragraph (b) is commonly referred to as a super lot."*

Whilst the Draft West Lake SIC is still in draft form, there is no specific exclusion which applies to the circumstances of the first superlot subdivision because (5)(a) will not be satisfied. However, the intent of the draft exclusions is that an exemption should apply for superlot subdivisions where no new dwelling entitlements are created.

The first future superlot subdivision application will clearly demonstrate no works are proposed. If necessary the application can nominate a restriction on the title of new superlots that no dwelling entitlements will apply. This restriction will ensure there are no servicing and public utilities requirements generated by the first superlot subdivision.

The development application for first superlot subdivision will clearly demonstrate no works or activities will be consented to and no cost of development which would trigger Developer Contributions in accordance with Section 7.12 to the Environmental Planning and Assessment Act, 1979.

1.3 Superlot subdivision and State Infrastructure Contributions

DPEI raised concerns that a superlot subdivision may fragment land ownership and potentially complicate future negotiations with multiple landowners for State Infrastructure Contribution Voluntary Planning Agreements (SIC VPAs). The DPIE letter dated 25 July 2019 requested the application be amended for:

- the first superlot subdivision to create only two lots; and
- for SIC VPA and contamination matters to be resolved prior to any further subdivision application.

Bridgehill confirms the purpose of the superlot subdivision is to enable the transfer of land ownership from EnergyAustralia. There will be only two landowners. This arrangement effectively addresses DPIE's concerns for a maximum of two superlots for the purposes of SIC VPA negotiations.

It is Bridgehill's intention to retain ownership of the Central and Northern Precincts through subsequent subdivisions and development phases. This includes commitments to a SIC VPA, a local scale Voluntary Planning Agreement (VPA), a site-specific development control plan (DCP) and an Aboriginal Cultural Heritage Management Plan (CHMP).

Therefore DPIE can be reassured that negotiations for a SIC VPA will not be unduly complicated as a result of fragmented land ownership.

Condition 25 in Schedule 3 to the Concept Approval currently states as follows:

> ***"25 Satisfactory Arrangements for the provision of Designated State public infrastructure***
>
> *The first development application to Council (refer to Condition A6) must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure, in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009."*

It is recommended this condition be modified as indicated by the following 'track changes' style text (strike through text to be deleted, underlined text to be added) to state:

> "***25 Satisfactory Arrangements for the provision of Designated State public infrastructure***
>
> *The first development application ~~to Council (refer to Condition A6)~~ for urban development of the Northern and Central Precincts must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure for subdivision of land within the northern and central precincts in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009.*
>
> *The first development application for urban development of the Southern Precinct (as shown in the approved Proposed First Superlot Subdivision Plan) must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure for the subdivision of land in the Southern (Lakeside) Precinct in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009."*

This modification of Condition 25 ensures SIC VPA agreements are in place at a time appropriate to the future urban development for each precinct. The modification ensures SIC VPA arrangements are made only with the two future owners of superlots and addresses the concerns of DPIE.

1.4 Superlot Subdivision to facilitate future remediation works

The DPIE letter dated 25 July 2019 requested the application be amended for:

- the first superlot subdivision to create only two lots; and
- for SIC VPA and contamination matters to be resolved prior to any further subdivision application.

A consent authority must be satisfied that land can be made suitable for a proposed use in accordance with the requirements of *State Environmental Planning Policy No.55 (Remediation of Land)* (SEPP 55). The first superlot subdivision will not require any works and will not request any use of the land in a manner any different from the current state of the land. Complete remediation works would not be necessary to satisfy the assessment and determination of the first superlot subdivision.

Future development applications for works and use of the land will require land to be made suitable in accordance with SEPP 55. Condition A6 and other relevant conditions of consent are to be modified accordingly as recommended in Sections 1.5 and 1.6 and Appendix B.

1.5 Modification of Condition A6

Noting the superlot subdivision will not propose or approve any works or changes to land use, this modification determination will require changes to Condition A6 in Schedule 2 to the Terms of Approval.

Condition A6 currently states as follows:

> *A6 First Future Application*
>
> *The first future application must be an application to Council for superlot subdivision of the entire sire and is to be generally in accordance with the land use boundaries provided in the Concept Plan. In addition to other requirements of the Terms of Approval, this application must identify the sequential staging of the Concept Plan.*

It is requested that Condition A6 be modified as indicated by the following 'track changes' style text (strike through text to be deleted, underlined text to be added) to state as follows:

> *A6 First Future Application*
>
> *The first future application shall be an application to Council for superlot subdivision of the entire site and it is to be generally in accordance with the plan titled "Proposed First Superlot Subdivision Plan' prepared by Bridgehill Group Drawing Reference BH-001 Rev.01 dated 06/09/2019 and land use boundaries provided in the Concept Plan.*

It is not necessary to make reference in Condition A6 to "*the other requirements of the Terms of Approval*" because the other conditions of consent and Statement of Commitments apply without the need for this statement.

It is not necessary to identify sequential staging for the purposes of the superlot subdivision because the superlot subdivision requires a site-specific DCP. Future development applications after the superlot subdivision must be consistent with the site-specific DCP. Consistency with the DCP negates the need for sequential staging.

Every development application submitted for the site must satisfy the requirements of SEPP 55. Every development application must therefore demonstrate that the land the subject of the application can be made suitable for the proposed use prior to the determination of the development application. Detailed Site Investigations (DSI) and Remedial Action Plans (RAPs) for any future development application will also identify in detail any need for sequencing of works and land uses to address contamination. Sequencing of works in accordance with contamination findings can only be determined once DSI and RAP information is completed. For this reason it is not appropriate to commit to staging and sequencing of the entire site at the time of the first future superlot subdivision.

The modifications proposed to Condition 25 (see Section 1.3) and Conditions 11 and 12 (see Section 1.6) will:

- negate the need for sequential staging to be nominated with the superlot subdivision; and
- ensure that site remediation is addressed in a manner consistent with SEPP 55.

1.6 Modification of Conditions 11 and 12

As explained above, the first superlot subdivision will not propose works or change the use of the land. The first superlot subdivision will satisfy SEPP 55 as the approval will not risk harm to human health or the environment.

The response from the NSW EPA dated 7 June 2019 specifically states that the EPA comments are not based on a review of existing Conditions 11 and 12. The letter does list the outstanding contamination

assessment requirements and identified the timeframe by which those matters are recommended to be addressed. These requirements and timeframes are repeated from the EPA letter as follows in Table 1-1:

Table 1-1: Summary of EPA comments dated 7 June 2019

EPA comment 07/06/2019	Implications for Timing and Carrying out of contamination investigation and remedial works	Implication for Conditions 11 and 12
1. Subdivision of residential precincts While a wholistic approach to contaminated site assessment of the Tallawarra Lands is preferred, EPA does not object to separating the residential areas into 2 broad groups as proposed by the Proponent. That is separating the Northern and Central Precincts (as 1 group) from the Southern Precinct. To ensure ongoing site contamination is managed holistically and efficiently, further divisions resulting in separate or piecemeal progression of contamination requirements are unlikely to be supported.	The EPA supports contamination assessment and remedial work proceeding in two parts – one part being the Northern and Central precinct and the other being the Southern (Lakeside) Precinct.	EPA comments support Conditions 11 and 12 being modified to apply to two separate land areas being 'north of Yallah Bay Road' and 'south of Yallah Bay Road' (consistent with the land ownership patterns shown in Figure 1-3.
2. Completion of contamination sampling and site assessment The remaining site contamination assessments/investigations for the Areas of Environmental Concern (listed in Condition 11) and asbestos (Condition 12) must be completed prior to the submission of any DA for subdivision development.	The EPA supports the completion of assessment and investigation prior to any DA for subdivision development. That is, prior to any DA for subdivision that proposes works and changes to the current land uses. The EPA therefore has no objection to the first superlot subdivision DA progressing without further assessment and investigation.	EPA comments do not prevent or conflict with Conditions 11 and 12 being modified as proposed below.
3. Accredited Site Auditor Report on Contamination Sampling and Site Assessment Any submission of a subdivision DA must be supported by a report from a NSW EPA Accredited Site Auditor which confirms the adequacy of the contamination investigations and any remediation action plan and certifies that the site/s can be made suitable for the proposed use.	The EPA comment is consistent with the requirements of SEPP 55 where a DA proposes works and/or activities and uses which potentially expose humans and/or the environment to harm. The first superlot subdivision does not propose works or activities on the land and therefore SEPP 55 can be satisfied.	EPA comments are consistent with the proposed modification of Conditions 11 and 12. The modification seeks to separate the reporting requirements to match the two spatial areas of future subdivision and development work.
4. Remediation Any remediation required must coincide with the first earthworks/breaking of ground. This may include clearing or infrastructure installation. This must be in advance of any dwelling construction.	The EPA comment is consistent with the requirements of SEPP 55. The first superlot subdivision will not require breaking of ground, clearing or installation of infrastructure.	EPA comments are consistent with the proposed modification of Conditions 11 and 12 as detailed below.
5. Site Auditor Statement Prior to any dwelling construction the Proponent must submit a NSW EPA Site Audit Statement validating that any remediation has been completed as necessary and the site is suitable for the proposed use.	The EPA comment is consistent with the requirements of SEPP 55. Any future DA for any subdivision, site work or new use of the land will be required to demonstrate the land is suitable.	EPA comments are consistent with the proposed modification of Conditions 11 and 12 as detailed below.

We therefore request the following modifications to Conditions 11 and 12 with full consideration of:

- the comments received from the NSW EPA dated 7 June 2019; and
- the DPIE comments that contamination issues need to be satisfied prior to the next application following the superlot subdivision

1.6.1 Condition 11

Condition 11 is requested to be modified as indicated by the following 'track changes' style text (strike through text to be deleted, underlined text to be added:

> ***11 Further Investigation of the Areas of Environmental Concern and engagement of a Site Auditor accredited under the Contaminated Land Management Act 1997***
>
> *~~Future applications that include those lands nominated as Areas of Environmental Concern (AECs) in the Coffey Environments Report (December 2010)~~ The following development applications must be accompanied by a further environmental assessment report*
>
> *(i) The first future superlot subdivision application to Council (refer to Condition A6) must include a further environmental assessment report in relation to the northern and central super lots; and*
>
> *(ii) Any application for the further subdivision of the superlot containing the Southern Precinct (as identified in Condition A6) must include a further environmental assessment report in relation to the whole of the Southern Precinct.*
>
> *The further environmental assessment report must address all relevant Areas of Environmental Concern in the Coffey Environment Report (December 2010). In addition to adopting the recommendations contained in Section 12 of the Coffey Environments Groundwater Modelling Assessment report, the further investigations must consider, where relevant:*
>
> - *the potential for contaminants present in the soil and ground in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, Duck Creek and ultimately to the receiving waters of Lake Illawarra, and measures to address this including the feasibility of remediation of contaminated soils and/or the containment of the sources of contamination;*
> - *measure to ensure that the environment attributes of conservation lands on the site are not adversely impacted on by contaminants present in the soil and groundwater;*
> - *recommendations for the ongoing management of contaminated groundwater;*
> - *the potential for the contamination present in soil and groundwater in the vicinity of the ash ponds to adversely affect groundwater dependent ecosystems on the site; and*
> - *any risks to human health or the environment.*
>
> *Following the completion of the further investigations, the proponent must engage a Site Auditor accredited under the Contaminated Land Management Act 1997 to verify the adequacy of the investigations (and any proposed remediation). Prior to the issue of any Subdivision Certificate (other than for the first superlot subdivision) the proponent must obtain a Site Audit Statement to certify that the ~~site~~ land the subject of the Subdivision Certificate is suitable for the proposed use. No building may be erected on the land prior to the issue of a Site Audit Statement certifying that the land is suitable for the proposed building and associated use."*

The modifications do not change:

- the requirement to consider the findings of contamination investigations acknowledged in the current Concept Approval; or
- the site-specific matters requiring further investigation as identified to date by the Concept Approval.

Therefore the modifications do not change the requirements to address specific AECs as required by the EPA.

The modifications do change the condition to allow:

- Investigation and reporting to be spatially separated so that separate landowners can fulfill the requirements of SEPP 55 with future DAs;

- Appropriate levels of investigation and reporting to be completed for the Central and Northern superlot by Bridgehill at the time of the first superlot subdivision consistent with SEPP 55 and EPA requirements; and
- Appropriate levels of investigation and reporting with any future DA consistent with the requirements of SEPP 55 and EPA requirements.

1.6.2 Condition 12

Condition 12 is requested to be modified as indicated by the following 'track changes' style text (strike through text to be deleted, underlined text to be added:

> ***12 Engagement of a site auditor to verify the adequacy of asbestos soil sampling and asbestos contamination investigations***
>
> *The first future superlot subdivision application to Council (refer to Condition A6) must include, in relation to the northern and central super lots, a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by the Douglas Partners (July 2010) and any further investigations subsequently undertaken by the proponent and certification ~~of the suitability of~~ that the ~~site~~ northern and central super lots can be made suitable for their proposed use.*
>
> *Any application to further subdivide or carry out any works on the Southern Precinct (as defined on the Super Lot Subdivision Plan and Condition A6) must include a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by the Douglas Partners (July 2010) and any further investigations subsequently undertaken by the proponent and certification that the Southern Precinct can be made suitable for its proposed use.*

The modifications do not change:

- the requirement to consider the findings of contamination investigations acknowledged in the current Concept Approval; or
- the site-specific matters requiring further investigation as identified to date by the Concept Approval.

Therefore the modifications do not change the requirements to address specific asbestos-related investigations as required by the EPA.

The modifications do change the condition to allow:

- Investigation and reporting to be spatially separated so that separate landowners can fulfill the requirements of SEPP 55 with future DAs;
- Appropriate levels of investigation and reporting to be completed for the Central and Northern superlot by Bridgehill at the time of the first superlot subdivision consistent with SEPP 55 and EPA requirements; and
- Appropriate levels of investigation and reporting with any future DA on any part of the site consistent with the requirements of SEPP 55 and EPA requirements.

1.7 Modification of other Conditions

The superlot subdivision can separate the site into two ownerships. Subsequent developments applications (DAs) for more intensive development and land use will proceed based on the intentions of the two future landowners. The site-specific DCP to be submitted with the first future superlot subdivision will coordinate development controls for the entire site such that precincts can be developed simultaneously or separately and still achieve consistency with the DCP.

In order to proceed under two separate land ownerships after the first superlot subdivision, several other conditions are to be modified to match the final changes to the Concept Plan, conceptual layout and supporting information and accurately identify timing and responsibility for deliverables and requirements.

A full set of recommended modifications to the wording of conditions is contained in Appendix B along with a justification for each modification. Modifications to conditions other than A6, 11 and 12 do not raise any matters related to contamination assessment and satisfactory arrangements for State infrastructure and are therefore not further discussed in Section 1 to this letter.

1.8 Statement of Commitments

The wording of the Statement of Commitments needs to be modified to align with proposed first future super lot subdivision outcomes and adjustments to the Concept Plan, conceptual lot layout and supporting documents.

Statement of Commitments #3 specifically relates to the super lot subdivision plan and must be modified to match Condition A6.

Statement of Commitment #3 currently states as follows:

> *"3. Superlot Subdivision*
>
> *Commitment: TRUenergy commits to lodging a development application with Wollongong City Council to carry out a superlot subdivision generally in the manner illustrated in the indicative superlot plan prepared by LandTeam and included at Figure 10 of the EA. TRUenergy also commits to preparing more detailed subdivision plans and notes that further environmental assessment will not be required, having been adequately addressed through the Concept Plan application."*

It is requested that Item #3 be modified as indicated by the following 'track changes' style text (strike through text to be deleted, underlined text to be added) to state as follows:

> *"3. Superlot Subdivision*
>
> *Commitment: ~~TRUenergy~~ The landowners commit to lodging a development application with Wollongong City Council to carry out a superlot subdivision generally in the manner illustrated in the 'Proposed First Superlot Subdivision Plan' prepared by Bridgehill Group Drawing Reference BH-001 Rev.01 dated 06/09/2019 ~~TRUenergy~~ The landowner shall also commit to preparing more detailed subdivision plans to be submitted in accordance with the requirements for development application lodgement in Schedule 1 Part A to the Environmental Planning and Assessment Regulation 2000.'*

The proposed modification:

- is directly applicable to the appropriate future landowners separated by precincts;
- makes reference to the appropriate super lot subdivision plan in Condition A6; and
- removes the current ambiguity as to the further information required to be submitted with any future development application.

1.9 Other modifications to Statement of Commitments

A full set of recommended modified Statement of Commitments is contained in Appendix C along with a justification for each modification.

1.10 Summary of Response to Key Issue 1

The first superlot subdivision is necessary for changes to land ownership.

Condition A6 is to be modified to recognise the proposed first super lot subdivision plan.

There will be no works, no infrastructure, breaking of ground and no change to the current use with the first superlot subdivision.

There will be no new dwelling entitlements created by the first superlot subdivision and no nexus for payment of developer contributions.

After the Central and Northern Superlots are transferred to Bridgehill, development applications for further subdivision and works within the Central and Northern Precincts will be made only by Bridgehill. These future subdivisions will not fragment SIC VPA negotiations.

The first superlot subdivision will not propose works, nor require works or a change of land use.

Conditions 11 and 12 are to be modified to match the anticipated future further subdivision and development of the superlots by separate landowners.

SEPP 55 will be satisfied for the first superlot subdivision without the need for implementation of a Remedial Action Plan (RAP) and without the need for verification of remediation works being completed. Conditions 11 and 12 are to be modified to require completion of investigation and completion of a RAP (if needed) to

demonstrate the Central and Northern Precinct lands can be made suitable for the proposed use. This will satisfy the comments from the EPA and the requirements of SEPP 55.

SEPP 55 will be satisfied for any future development applications proposing works and changes of land use. Each application will demonstrate the land can be made suitable for the proposed use and the works will not harm the environment. The modified Conditions 11 and 12 will ensure this is the case for all DAs.

2 Heritage

2.1 Archaeological test excavations

DPIE's letter of 25 July 2019 required the results of archaeological testing within the additional urban footprint to be provided with this response. To clarify, the additional urban footprint applies to North and Central super lots only. The Southern Precinct remains unchanged.

At the meeting on 2 August 2019, Bridgehill and Cardno presented DPIE with a timeframe for works to complete an AHIP for the additional urban footprint. In summary, the timeframe for reasonable completion of an AHIP was three to four months.

Consequently, DPIE agreed to extend the timeframe to respond on the understanding that Bridgehill and Cardno had commenced the AHIP process and would keep DPIE updated on that progress.

Bridgehill, Cardno and Biosis subsequently met with Wollongong staff of the Department of Environment, Energy and Science (DEES) (formerly Office of Environment and Heritage) on 14 August 2019. At this meeting DEES indicated an AHIP is required *prior to any approval for disturbance of the site such as for site preparation or construction works*.

DEES indicated a willingness to consider conditions of approval which confirm an AHIP will be obtained *prior to any approval for disturbance of the site* acknowledging the following:

- First superlot subdivision approval is required before any development application proposing works;
- no works will be required or approved by the first superlot subdivision;
- the existing Concept Plan approval requires the submission of a CHMP with the first superlot subdivision application and the modification to the Concept Approval does not seek to change this requirement;
- the CHMP will include specific site management practices and standard protocols for unexpected finds;
- test excavations, consultation and reporting are underway in conjunction with a Review of Environmental Factors (REF) under Part 5 to the EP&A Act. The REF will address the undergrounding of power lines through the Northern Precinct. Test excavation, consultation and reporting with the REF will inform methodology and management recommendations suitable for an AHIP and CHMP for lodgement with future development applications
- tasks have commenced on consultation and test excavations and Bridgehill and Cardno have demonstrated commitment to undertaking the necessary steps to complete AHIP and CHMP.

Therefore, as confirmed with DEES:

- an AHIP is not required prior to the first superlot subdivision approval as there will be *no disturbance of the site* at this stage
- site management protocols will be included with the CHMP submitted with the first superlot subdivision
- the CHMP will apply to the entire site and to all future development applications and works once the CHMP is approved by Council
- an AHIP is in the process of preparation (see Section 2.5 below); and
- an AHIP will be required *prior to any approval for site disturbance*.

In this regard, there is no need to modify the Concept Approval to require testing and an AHIP prior to the determination of the modification under (former) Section 75W.

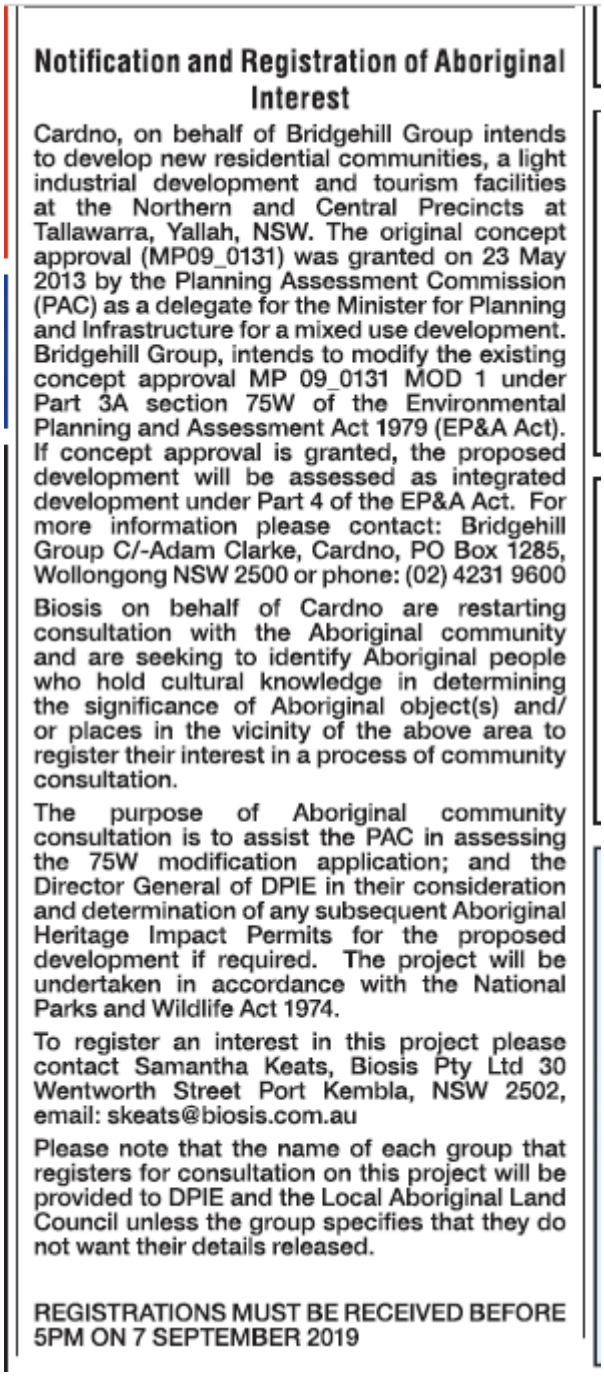
2.2 Progress on Testing and Consultation

DPIE requested the results of archaeological testing to be provided with this response.

Cardno, Bridgehill and Biosis have commenced test excavations and consultation and are committed to completion of this process as required by modified conditions. Testing and reporting are currently under a strict timeframe for completion and must be completed to enable preparation of an AHIP and CHMP to match the timing of lodgement of the first superlot subdivision application.

Figure 2-1 is a copy of the Public Notice of consultation and the full page content of the Notice is included in **Appendix D**.

Figure 2-1 Copy of Public Notice of advising of Consultation opportunity



Notification and Registration of Aboriginal Interest

Cardno, on behalf of Bridgehill Group intends to develop new residential communities, a light industrial development and tourism facilities at the Northern and Central Precincts at Tallawarra, Yallah, NSW. The original concept approval (MP09_0131) was granted on 23 May 2013 by the Planning Assessment Commission (PAC) as a delegate for the Minister for Planning and Infrastructure for a mixed use development. Bridgehill Group, intends to modify the existing concept approval MP 09_0131 MOD 1 under Part 3A section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act). If concept approval is granted, the proposed development will be assessed as integrated development under Part 4 of the EP&A Act. For more information please contact: Bridgehill Group C/-Adam Clarke, Cardno, PO Box 1285, Wollongong NSW 2500 or phone: (02) 4231 9600

Biosis on behalf of Cardno are restarting consultation with the Aboriginal community and are seeking to identify Aboriginal people who hold cultural knowledge in determining the significance of Aboriginal object(s) and/ or places in the vicinity of the above area to register their interest in a process of community consultation.

The purpose of Aboriginal community consultation is to assist the PAC in assessing the 75W modification application; and the Director General of DPIE in their consideration and determination of any subsequent Aboriginal Heritage Impact Permits for the proposed development if required. The project will be undertaken in accordance with the National Parks and Wildlife Act 1974.

To register an interest in this project please contact Samantha Keats, Biosis Pty Ltd 30 Wentworth Street Port Kembla, NSW 2502, email: skeats@biosis.com.au

Please note that the name of each group that registers for consultation on this project will be provided to DPIE and the Local Aboriginal Land Council unless the group specifies that they do not want their details released.

REGISTRATIONS MUST BE RECEIVED BEFORE 5PM ON 7 SEPTEMBER 2019

Registered Aboriginal Parties (RAPs) in response to the above Public Notice are as follows:

Organisation	Name
Illawarra Local Aboriginal Land Council	
Woronora Plateau Gundangara Elders Council	Paul Cummins and Kayla Williamson
	James Davis
Warra Bingi Nunda Gurri	Nathanial Kennedy
Guunamaa Dreamin Sites and Surveying	Richard Campbell
Gumaraa	Jodie Edwards and Lisa Bazzano

Yerramurra (Murrin Clan/Peoples)	Blaan Davis
Duncan Falk Consultancy	Duncan Falk
Barraby Cultural Services	Lee Field
Yurrandaali Cultural Services	Bo Field
Yulay Cultural Services	Arika Jalomaki
	Paul James Mcleod
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson and Darleen Johnson
Muragadi	Anthony Johnson
	Leanne Tungai
South Coast Peoples	

Test excavations are underway for land within the Northern Precinct in conjunction with a REF for undergrounding of power lines. An AHIP will be obtained as part of the REF process. The information gathered from these test excavations will be used to inform the AHIP and CHMP for future development applications within the urban footprint of the northern precinct that will require site disturbance.

AHIPs cannot spatially overlap. The AHIP issued for the undergrounding of power lines within the Northern Precinct will also apply to the disturbance work that will be proposed with development applications after the first superlot subdivision.

Cardno, Bridgehill and Biosis will keep DPIE informed of the progress of testing and AHIP preparation whilst the assessment of this modification is in progress. As stated above and as agreed by DEES, an AHIP is not required for the first future superlot subdivision as there will be no site disturbance associated with the first future superlot subdivision.

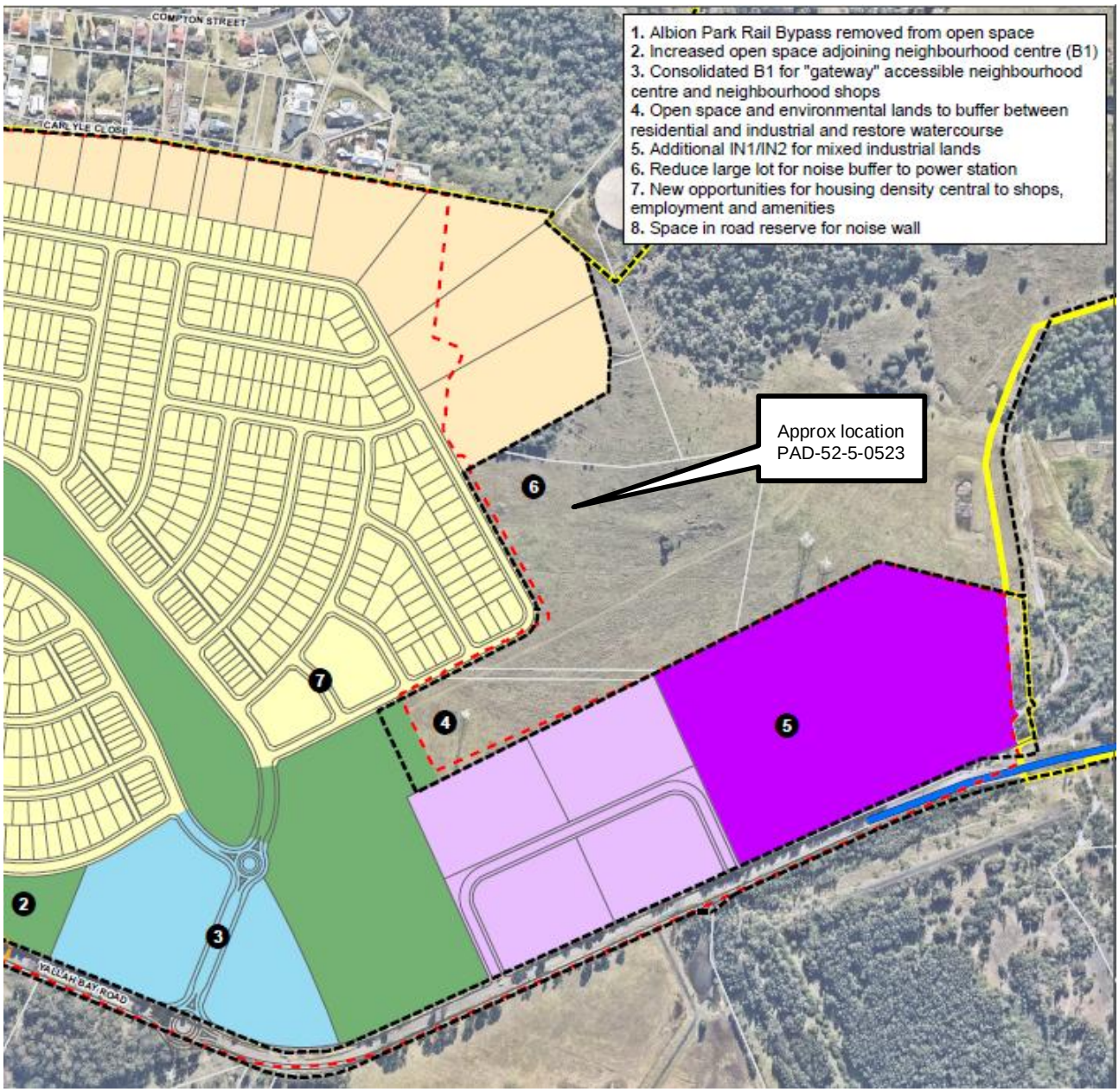
Draft Aboriginal Archaeological reports for the additional urban footprint of the Northern Precinct and a Draft Aboriginal Cultural Heritage Assessment Report (ACHAR) have been provided to the Registered Aboriginal Parties (RAPs) for review and comment. To date there have been five (5) responses from the RAPs and all feedback has been positive and in agreement with the draft reports. Consultation on the draft reports concludes on 22 November 2019. Following this, an application for a testing AHIP will be prepared and submitted to DEES for detailed test excavations.

2.3 Adjusting the eastern boundary of the Central Precinct to protect PAD 52-5-0523

As requested by DPIE, the boundaries of the Central Precinct have been adjusted to provide an appropriate clearance from the location of PAD 52-5-0523. Details of this adjustment are indicated in Figure 2-1. This PAD site will remain undisturbed as part of a future environmental management lands. The PAD site will be subject to ongoing management and protection in accordance with the Aboriginal Cultural Heritage Management Plan (CHMP) required by Condition 8 to Schedule 3 of the Concept Approval.

An CHMP is currently in preparation. In accordance with the requirements of Condition 8 Schedule 3 of the Concept Approval, the CHMP will be submitted with the superlot subdivision development application.

Figure 2-1 – Location of PAD-52-5-0523 and adjustment to Central Precinct boundary



2.4 Design of Future DAs to retain and protect the Fig Tree

The fig tree located within the Central Precinct is associated with TLPD AFT 9 (AHIMS 52-2-0615). Further cultural significance investigations are currently underway. The Tallawarra Central Precinct Archaeological Report completed by Biosis and dated 26 September 2017 indicates that, whilst the tree may have cultural significance, the specific location of the tree and its setting have not yet been determined to have cultural or place-based significance. Recommendation 3 to the Archaeological Report of 2017 states as follows:

> *Recommendation 3: Conservation of Fig Tree associated with TLPD AFT 9 (AHIMS 52-5-0615)*
> *If possible the Fig Tree associated with TLPD AFT 9 (AHIMS 52-5-0615) should be conserved and incorporated into the modification of the concept approval*

Therefore investigations are currently underway to determine if it is culturally acceptable and practically achievable to relocate the tree to the nearby riparian zone. Investigations are being conducted in terms of tree viability (arborist) and the context and setting as determined from an Aboriginal cultural perspective.

Should these investigations demonstrate support for the relocation and replanting of the tree – this will be proposed in a future detailed application for subdivision of the land on which the tree is located.

Should the investigations not support relocation of the tree then a future subdivision will propose strategies for its retention in a manner compatible with proposed works.

The significance of the fig tree will be further investigated and appropriate management measures identified with the preparation of the CHMP (see Section 2.5). The CHMP will be developed in consultation with RAPs to ensure the future management of the tree is supported in terms of cultural heritage and place significance.

The modification to the Concept Approval does not seek to change the zoning or the development potential of the land on which the fig tree is currently sited. The current Concept Approval locates the fig tree within residential land in the Central Precinct. The modification does not change this. In this regard the conditions for future land use surrounding the fig tree are not proposed to change in comparison to the approved Concept Plan.

2.5 CHMP

Condition 8 in Schedule 3 to the Concept Approval requires a CHMP to be submitted with the first future super lot subdivision application. Noting the modifications requested to conditions detailed in Section 1 above, it is requested that Condition 8 be modified as follows:

> *"**8. Cultural Heritage Management Plan***
>
> *The first future superlot subdivision application to Council (refer to Condition A6) ~~for~~ shall be accompanied by a Cultural Heritage Management Plan (CHMP) that details how impacts on Aboriginal and non-Aboriginal heritage ~~across the entire site~~ will be minimised and managed.*
>
> *The plan shall be prepared in two parts to match the responsibilities of landowners in preparing for, and implementing, all future development. Part 1 of the plan shall apply to the Central and Northern Superlots and shall be submitted in detail with the first future superlot subdivision application. Part 2 of the Plan shall apply to the Southern (Lakeside) Precinct and shall be submitted with the first development application for the Southern Precinct following the approval of the first future superlot subdivision.*
>
> *The plan shall include, but not necessarily be limited to:*
>
> *(a) Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items to minimise and avoid impacts on these items;*
>
> *(b) How heritage items (Aboriginal objects and relics or works) discovered during the construction of the project will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the project area;*
>
> *(c) Stop-work and notification procedures to be implemented should any unexpected impact to archaeological deposits and/or State significant relics not previously identified be discovered;*
>
> *(d) A procedure for continued consultation with the relevant Aboriginal stakeholders during site preparation and subdivision works; and*
>
> *(e) Procedures to be followed should non-compliance against any of the provisions of the management plan occur.*
>
> *All future applications must demonstrate how they will implement the Cultural Heritage Management Plan."*

This modification does not change the intent or outcome of the condition.

This modification is needed to match the responsibilities of future landowners and the practical consequences for land management and land development to be undertaken for the separate precincts.

2.6 Summary of Response to Key Issue 2

DEES confirm an AHIP is required prior to any approval for site disturbance.

An AHIP is not required prior to the determination of this modification in accordance with (former) Section 75W.

An AHIP will not be required for the first future superlot subdivision development to be approved as there will be no site disturbance required by this application.

The boundaries of the Central Precinct have been adjusted to protect PAD 52-5-0523.

Investigations are underway to identify the most culturally and arboricultural appropriate future treatment of the fig tree in proximity to TLPD AFT 9 (AHIMS 52-2-0615). Outcomes will be included in the CHMP. Nevertheless this modification does not change the original Concept Approval in relation to the fig tree and this matter should not prevent the assessment and determination of this 75W application.

The CHMP is in preparation. Modification to Condition 8 is requested to match the responsibilities of future landowners and the pattern of future development over the entire site. The CHMP is intended to be submitted with the development application for the first future superlot subdivision and will be in place prior to the lodgement of any future DA for site works and/or a change in land use.

A Due Diligence Aboriginal Archaeological Assessment has been completed for the transmission easement land within the Northern Precinct and will be submitted to DPIE and DEES after completion of consultation with RAPs on 22 November 2019. DPIE will be provided with the final Due Diligence Assessment when consultation and any revisions are complete.

The Due Diligence Assessment will be sufficient for the determination of the Modification application as no site disturbance is proposed with the Modification or the first superlot subdivision.

A Draft CHMP has been completed and is currently subject to consultation with RAPs. Consultation will be completed on 22 November after which time the CHMP will be finalised. A testing AHIP application will be made when the CHMP is finalised.

Cardno and Bridgehill will continue to keep DPIE updated as these matters progress.

3 Water Quality

DPIE, DEES (OEH), Department of Industry (Fisheries) requested assessment of the Concept Plan against the requirements of the publication *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions*, demonstrating the impacts of the proposal on the water quality health and aquatic environment of Lake Illawarra. Our further response is as follows.

The *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions* (The Framework, OEH and EPA 2017) was developed to provide management outcomes for the impacts of various land uses and allows decision-makers to determine management responses required to meet key objectives for the protection of water quality and the health of the aquatic environment. The purpose of the Framework is to:

- Ensure that the community's environmental values and uses for our waterways are integrated into strategic land-use planning decisions;
- Identify relevant objectives for the waterway that support the community's environmental values and uses that can be used to set benchmarks for design and best practice;
- Identify areas or zones in waterways that require protection;
- Identify areas in the catchment where management responses cost-effectively reduce the impacts of land-use activities on our waterways; and
- Support management of land-use developments to achieve reasonable environmental performance levels that are sustainable, practical and socially and economically viable.

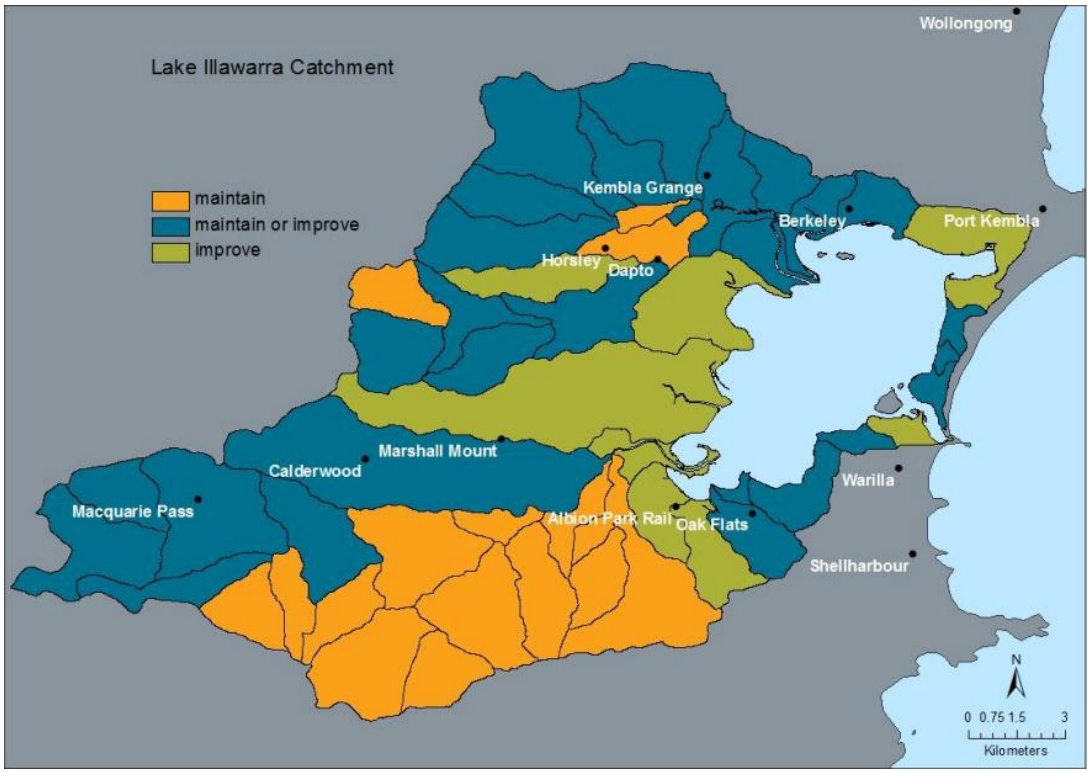
The Framework has already been applied to Lake Illawarra with two Actions being included in the Illawarra-Shoalhaven Regional Plan (5.4.2 and 5.4.3) as a result. Details are available as a case study in The Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (OEH and EPA 2017). Key findings from applying the Framework were that:

- The current pollution load reduction targets specified in Council's Development Control Plan (DCP) were insufficient to achieve as sustainable water quality outcome for Lake Illawarra;
- Council had concerns regarding the cost of stormwater management;
- The capital infrastructure and maintenance costs for traditional stormwater treatment, as well as land requirements, would be relatively large for greenfield developments in order to achieve sustainable water quality outcomes; and
- Results indicated that there was a need to investigate more water sensitive approaches to stormwater management for greenfield development, such as stormwater harvesting and re-use schemes and restoration of riparian corridors.

Design and implementation plans were not developed as a part of the case study, however a benefit map identifying priority areas in the Lake Illawarra catchment for cost-effective stormwater management was produced. This benefit map has been reproduced in **Figure 3-1**.

Tallawarra falls within the "Improve" (green) area on the map. "Improve" areas identify areas in the catchment that pose the highest risk to waterway health, but are also where traditional stormwater management would improve the health of the lake cost-effectively. In these areas, reaching (or going beyond) the general set of stormwater pollution load reduction targets currently specified in Council's DCP would improve the health of Lake Illawarra. However, Tallawarra is also a greenfield development and stormwater harvesting and riparian management should also be considered as a beneficial effect on the health of Lake Illawarra.

Figure 3-1 Benefit map identifying priority areas in the Lake Illawarra catchment for cost-effective stormwater management



As detailed in the previous Technical Memorandum – Tallawarra Land Water Quality Requirements (Cardno 2019), improved stormwater pollutant load reduction targets for the Tallawarra Lands proposal have been specified. The targets reflect a balance between protecting Lake Illawarra and ensuring the sustainability of ongoing operation and maintenance of stormwater assets (that is, economic viability to the community and public benefit). These targets are considered to be in accordance with the objectives of the Framework as they meet recommendations for developments located within an “improve” zone identified on the benefits map developed in the Lake Illawarra Case Study.

Cardno have conducted conceptual water quality modelling using the software MUSIC to determine WSUD requirements for the Tallawarra Lands development. For details of the proposed treatment train, refer to the previous Technical Memorandum – Tallawarra Land Water Quality Requirements (Cardno 2019). Results demonstrate that the proposal meets the improved water quality targets (refer **Table 3-1**) and as such the proposal meets the requirements of the Framework.

In addition, the Tallawarra Lands future site-specific DCP will include stormwater re-use in the form of rainwater tanks and rainwater re-use provisions and new riparian revegetation of watercourses. This is in accordance with the recommendations of the Lake Illawarra Case Study for a greenfield development. Therefore it is expected that the proposal will result in a neutral or beneficial outcome on the water quality health and aquatic environment of Lake Illawarra.

Table 3-1 Pollutant Load Reductions for Lake Illawarra discharge from the proposed Tallawarra Development

Pollutant	Proposed Scenario Pollutant Load (kg/yr)	Residual Pollutant Load (kg/yr)	Total Pollutant Load Reduction (%)	Target Reduction (%)
TSS	87,600	6,970	92	90
TP	121	40.6	66.6	65
TN	975	483	50.5	50
GP	14,900	32.3	99.8	95

In summary:

- water quality modelling and analysis has been done and demonstrates beneficial impacts can be achieved consistent with the Framework;

- riparian lands will be protected and restored as already identified in the Concept Plan approval and this is not subject to modification; and
- The Framework requires specific objectives and cost-effective measures to be adopted consistent with community values and these are best established through a publicly-exhibited site-specific DCP; and
- Water quality targets, improvement strategies and measures will be included in the site-specific DCP required by Condition A5 to Schedule 2 of the Concept Approval.

No further conditions or modifications of the Concept Plan approval area required to address the Framework at this time.

4 Flood Impacts and Open Space

DPIE requested a specific response to the matters raised by Council regarding stormwater and the provision of open space. Specifically, information is required to clarify concerns about:

- filling of the watercourse between the playing fields and the industrial land; and
- removal or reduction in playing field west of the industrial land.

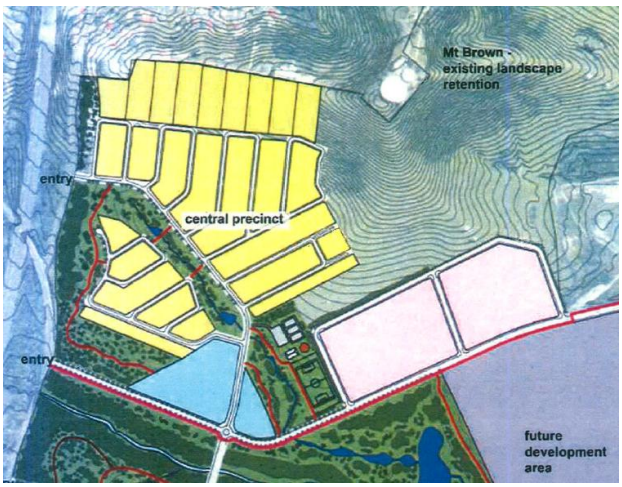
The location of the active public recreational space and playing fields within the Central Precinct is unchanged from the original Concept Plan and Concept Approval (see **Figure 4-1**).

The public recreation space and playing fields will be adjacent to the neighbourhood centre and east of an existing drainage depression. The drainage depression currently has no defined top of bank and is covered by exotic grasses. It is intended for the drainage channel to be re-contoured in accordance with a broader scale Flood and Stormwater Management Strategy. Condition 4 in Schedule 3 requires a Flood Risk Assessment and Management Plan to be submitted with the first future superlot subdivision application.

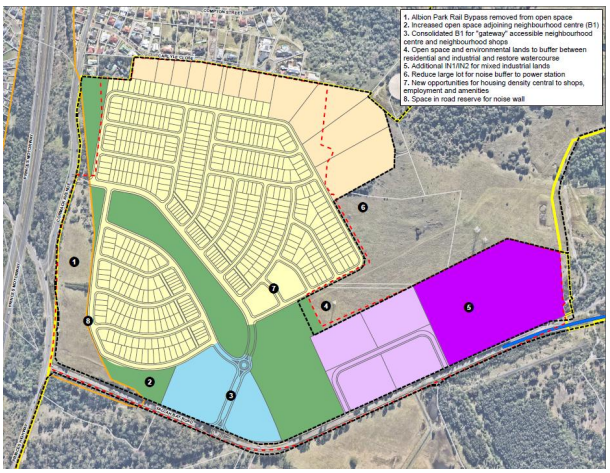
The natural drainage line will be landscaped consistent with a Vegetation Management Plan (VMP). A VMP is required to be submitted with the first future superlot subdivision application as required by Condition 10 Schedule 3 to the Concept Approval.

The final version of the Concept Plan shows a larger area of 'open space and environmental lands' east of the new industrial lands than previously approved. The comparison of the approval Concept Plan and the proposed modified concept plan is shown in Figure **4-1**.

Figure 4-1 Extracts comparing Concept Plan layout of future sportsfields in the Central Precinct



Extract from approved Concept Plan



Extract from Modified Concept Plan

In summary:

No changes are sought to the original Concept Plan with regard to the location of playing fields in the Central Precinct and Conditions 4 and 10 to Schedule 3 of the Concept Approval are adequate to require the necessary information to ensure flooding, stormwater and riparian treatment are compatible.

5 Roads and Connectivity

5.1 Background

Cardno and Bridgehill met with RMS on 9 August, 2019 and discussed all of the issues noted in correspondence from RMS and Council on transport and road-related matters. All matters were clarified and at the meeting and have now been resolved. The primary matters of concern highlighted in DPIE's letter of 27 July 2019 are addressed below and all other matters are addressed in **Appendix F**.

5.2 Traffic modelling, road upgrades and road design

DPIE, RMS and Council questioned the traffic modelling revisions including base data and road network assumptions to date. The data and analysis gap is due to further revisions to the modelling and design detail for the Albion Park Rail Bypass (APRB) project since the most recent version of the traffic and transport modelling for Tallawarra Lands. Furthermore the modifications to the Concept Plan and conceptual layout have changed the modelling inputs for future development.

Following our meeting, RMS granted Cardno access to the final design and data details for ABRB. This data was incorporated in the most recent revision of the traffic and transport analysis. The final version of the traffic and transport analysis is Appendix E.1 to this letter.

Of greatest concern to RMS in terms of traffic modelling was the Level of Service at intersections southbound exiting (offload) from the Princes Highway.

RMS noted Level of Service C at peak times would be essential to satisfy RMS requirements. The most recent revision of the APRB included a signalised roundabout at the easternmost roundabout to the southbound exit. This most recent APRB model had not been referenced in previous Tallawarra Lands traffic models. The modelling has been updated accordingly. This latest design has facilitated significant improvements in SIDRA intersection performance for future traffic movements as shown in the final traffic model in Appendix E.1.

The revised traffic modelling demonstrates that these south bound exits will perform in worse-case-scenario peak periods to Level of Service C or better based on an overly conservative traffic generation database. The revised modelling is therefore compliant with RMS requirements. See Appendix E.1 for details.

5.3 Haywards Bay Road link

Of concern to RMS, TfNSW and Council is the future of the link road between Yallah Bay Road and Haywards Bay. The importance of the road is related to:

- connectivity between all three precincts;
- connectivity with Haywards Bay and the new precincts
- as an alternative collector route to the Princes Highway for Haywards Bay residents
- the future provision of a bus route between the three precincts and to Haywards Bay within the local road network.

Fundamentally, RMS clarified that the primary concern is the link road would not be delivered and that the road would not have capacity for bus services.

Cardno and Bridgehill would like to emphasise that the modifications requested with this application in no way relate to the removal or deletion of the Haywards Bay Road link south of Yallah Bay Road.

We note that Condition B3 in Part B – Modifications to the current Concept Approval states as follows:

> *"B3 Access Road and Bridge over Duck Creek to the Lakeside (Southern Precinct) from Yallah Bay Road*
>
> *The access road and bridge over Duck Creek from Yallah Bay Road to the Lakeside Precinct must be deleted from the Concept Plan. Clause 8N(2)(b) of the Environmental Planning and Assessment Regulation 2000 prevents the Minister from being able to approve this roadway.*
>
> *(Note: The granting of approval for this road under Part 5 of the EP&A Act is not inconsistent with the term of this approval)."*

We also note that Conditions 1 and 20 to Schedule 3 of the current Concept Approval require the delivery of the road link and state as follows:

*"**1 Access road and bridge across Duck Creek can be constructed***

The first application for development within the Lakeside (Southern Precinct) must be accompanied by documentation which demonstrates to the satisfaction of Wollongong City Council that an access road and bridge across Duck Creek, linking the northern boundary of the Precinct with Yallah Bay Road can and will be constructed at no cost to Council prior to the development of that Precinct."

"20 Road link with Haywards Bay required to be traffic calmed and to accommodate two-way movement of buses

The future application which includes the Haywards Bay Road link shall demonstrate that the link can accommodate the two-way movement of buses and that it is traffic calmed to the satisfaction of Wollongong City Council."

We emphasise that this current application to modify the Concept Approval in no way seeks to delete the Haywards Bay Road link or change the abovementioned conditions of the approval.

The traffic modelling report includes the Haywards Bay link to be delivered at a time consistent with the existing Concept Approval requirements.

All versions of the modified Concept Plan have been prepared in order to be consistent with the abovementioned conditions. The final version of the modified Concept Plan is consistent with the existing conditions of the Concept Approval with regard to the Haywards Bay Road link. The conceptual road and lot layouts for the Central Precinct consistently show a roundabout located with the intention to provide a safely functioning connection to the Haywards Bay link road which has capacity for shared pathways and two way movement of buses. This roundabout is clearly shown in the Central Precinct Plan layout in Appendix A.

The Road Hierarchy Plan (Figure 5-7 in Appendix A) shows a collector road system will be delivered within the Central and Northern Precincts which is compatible with the Haywards Bay Road link by providing a clear and efficient collector road network to connect to the existing local road system and one connection point to the Princes Highway as required by Condition B2 to Part B – Modifications of the Concept Approval.

The existing and proposed bus networks are shown in Appendix A and also in the final Traffic and Transport Impact Report. These show the local bus services routes can be simply extended with efficient service loops in stages to match the development of each precinct. These bus network maps clearly show a two way, through link bus service can be connected through Haywards Bay via the Central Precinct and potentially connecting both north and south beyond the site.

5.4 Considerations of the Delivery of the Haywards Bay Road link with the Central Precinct

DPIE's letter of 25 July 2019 requested Cardno and Bridgehill give consideration as to how the Haywards Bay Road link could be delivered in conjunction with development of the Central Precinct.

Cardno and Bridgehill consider the existing conditions of the Concept Approval highlighted in Section 5.3 above are entirely adequate to ensure the road link is delivered in a manner consistent with the context of the overall project.

The first future superlot subdivision development will not propose or require any works. After the first future superlot subdivision is completed and land ownership has changed, subsequent development applications for each precinct will require separate landowners to undertake all relevant investigations for works (including but not limited to flooding and stormwater, contamination and remediation, revegetation) and negotiations for the delivery of public facilities and services at State and Local levels. This is specified in the Statement of Commitments and will be required for all future development applications proposing works and land uses. This modification does not seek to change the responsibilities of landowners to complete these obligations with future development applications.

The traffic modelling, road hierarchy plan and the bus routes maps in **Appendix A** clearly show that each precinct can be delivered to provide public road networks, share pathways and bus routes which will progressively integrate with the existing public transport and movement network. Furthermore, the current traffic and movement arrangements for Haywards Bay are not detrimentally impacted by the development of the Central and Northern Precincts. In this regard there is no clear nexus which requires the delivery of the Haywards Bay Road link with the development of the Central Precinct. Any such condition requiring the delivery of the Haywards Bay Road link with the Central precinct would likely fail the test of validity established in the House of Lords decision of *Newbury District Council v Secretary of State for the Environment [1981] AC 578*.

In fact, the best outcomes for the transport and movement network are for the Central and Northern Precincts to be delivered prior to the Southern Lakeside Precinct. This sequence will deliver the single connection point to the Princes Highway, the upgrading of Yallah Bay Road and collector rod connections to

the north east all of which will then set up favourable routes for the later development of the Southern Precinct and for Haywards Bay.

At our meeting of 9 August 2019 RM agreed there is no expectation or requirement for the delivery of the Haywards Bay road link in conjunction with the Central precinct and that it is sufficient that the link road be constructed in conjunction with the development of the Southern (Lakeside) precinct.

5.5 Mechanisms to ensure Superlot Subdivision does not preclude delivery of the Haywards Bay Road link

DPIE's letter dated 25 July 2019 requested consideration of any mechanisms needed to ensure the first future superlot subdivision and separate land ownership would not preclude the delivery of the Haywards Bay Road link.

As explained in Section 5.3 above, the existing conditions and Statement of Commitments adequately address requirements for the future delivery of the road link. This modification application does not seek to changes these conditions and commitments.

As explained in Section 5.4 above, the best outcomes from the sequential development of the precincts is for the delivery of the Central and Northern Precincts prior to the Southern Precinct. In this way, the collector road network and connections to the Princes Highway and to the north east will have been established with no detriment to Haywards Bay traffic and movement options. The Southern Precinct development will subsequently be capable of future connections north and south including bus and share pathway networks that will also benefit Haywards Bay.

No additional mechanisms are considered necessary.

In no way will the proposed modifications preclude the future delivery of the Haywards Bay Road link in accordance with the existing conditions of the Concept Approval and Statement of Commitments.

5.6 Road Connection between Central and Northern Precincts

DPIE's letter dated 25 July 2019 emphases the importance of Yallah Bay Road linking the Central and Northern Precincts and requested the road be labelled a "collector road".

The "collector road" label has been clearly included in all relevant revised figures and the final version of the modified Concept Plan and conceptual layouts for the Northern and Central Precincts as shown in Appendix A. This matter has been resolved and the status of the road will be matched by reference to the modified Concept Plan in the modified version of the Concept Approval.

5.7 Additional Follow up with RMS

Version 1 of the final RtS dated 13 September 2019 was submitted to RMS. Preliminary feedback from RMS on Version 1 is summarised as follows (and a copy of RMS comments is included in Appendix E.2):

- *Noise mitigation measures*
- *Cormack Avenue closure*
- *Intersection of Yallah Bay Road / Princes Highway.*

5.7.1 Noise Mitigation Measures

A teleconference was held between Cardno's Project Manager, Acoustic Consultant ERM and RMS staff on 21 October 2019. The discussion focussed on the previous issues raised by RMS regarding noise attenuation for new dwellings at the interface with the APRB. RMS requested information on the safeguards to be in place to ensure RMS would not be burdened with the construction of the noise wall and that acoustic attenuation methods would not encroach upon the RMS road corridor.

Cardno and Bridgehill have provided assurance to RMS that detailed noise impact assessment will be undertaken with a future development application for the subdivision of residential lots in close proximity to the RMS road corridor. Noise impact assessment would include:

- *Noise modelling of highway noise impacts (taking into account approved highway upgrade alignment and future traffic volume growth) on the allotment layout design taking into account proposed landform geometry and positioning of dwellings.*

- *Receiver noise levels assessed with reference to the Road Noise Policy Criteria (EPA 2011) and relevant RMS road noise modelling and mitigation guidelines*

Noise modelling of the allotment design will inform the need for mitigation such as noise barriers and/or architectural treatments to achieve external and internal noise criteria. Noise attenuation measures will be reflected in potential conditions of development consent applying to the land of the Central Precinct the subject of the future application.

Cardno has received an email from Con Tsitsos – RMS Environmental Officer – dated 31 October 2019 confirming that the above assurances is satisfactory (see Appendix E.2).

5.7.2 Cormack Avenue Closure

RMS sought confirmation that Cormack Avenue is to be closed as part of the development of the Central Precinct and that any required works will be completed prior to the issue of a Subdivision Certificate for smaller residential lots in the Central Precinct.

Closure of Cormack Avenue is part of the works identified for future traffic management.

Similar to noise attenuation measures, the timing of the closure of Cormack Avenue will be addressed with a future development application for subdivision of residential lots in the Central Precinct. Each future development application for subdivision will be accompanied by a development-specific Traffic Impact Assessment (TIA). Future TIAs will be consistent with the TIA submitted for the Concept Approval to date and any other future TIA associated with further subdivision of the site.

The site-specific DCP to be submitted with the first future superlot subdivision application will also include a road layout and hierarchy plan which is intended to indicate the closure of Cormack Avenue. The Draft site-specific DCP will be subject to public exhibition and referral to RMS for comment.

RMS can be assured that the closure of Cormack Avenue will be included in the site-specific DCP and a future development application for subdivision of residential lots in the Central Precinct.

5.7.3 Intersection of Yallah Bay Road and Princes Highway

RMS sought clarification as to the intersection design for Yallah Bay Road and the Princes Highway to ensure compatibility with the approved design and modelling for the APRB.

The Tallawarra TIA includes scenarios for traffic modelling where the Northern Interchange is not in place, that is, Scenarios 1, 3 and 5 as per the TIA (Cardno Report Rev 4 dated 18 April 2019). These scenarios are an alternate to the full roundabout proposed as part of the Albion Park Rail Bypass (APRB). With this in mind , Cardno looked at treatment options for this intersection. To maintain a level of service C or better, a signalised intersection using the existing road geometry was modelled in the updated report (see Appendix E1). It has been assumed that once the northern interchange is constructed, this intersection would be upgraded to the proposed design that has been approved as part of the APRB.

As explained above, future subdivision development applications will include development-specific TIAs and will be consistent with the TIA submitted for the Concept Approval to date. The intersection treatment will be designed appropriate to the stage of the subdivision as detailed in the scenarios of the TIA.

5.8 Summary of Response to Key Issue 5

The final version of the Traffic Impact Assessment is included in Appendix E and demonstrates full compliance with the requirements of RMS.

Existing conditions of the Concept Approval will ensure the delivery of the Haywards Bay Road link and this modification application does not seek to change these conditions.

It is unreasonable to require the delivery of the Haywards Bay Road link with the development of the Central Precinct particularly given that existing conditions of consent are entirely appropriate.

The best development sequence is for the delivery of the road network connections of the Central and Northern Precincts prior to the delivery of the Southern Precinct as the Central and Northern Precincts have no detrimental impacts for transport and movement options for Haywards Bay. Furthermore, the delivery of the Southern Precinct stands to benefit from transport connections established prior by the Central and Northern Precincts. Similarly, Haywards Bay stands to entirely benefit from transport infrastructure and services which will be established prior by the Northern and Central Precincts.

The conceptual layouts for the Central and Northern Precincts accommodate for the future connection of the Haywards Bay Road link with Yallah Bay Road and the broader road and movement network.

In no way will the proposed modifications preclude the delivery of the Haywards Bay Road link.

Noise attenuation for development of the Central Precinct will be subject to DA-specific noise impact assessment with a future development application for residential subdivision of land within the Central Precinct. Noise attenuation must be contained within the site and be the subject of future development applications.

Cormack Avenue will be closed. The closure is anticipated to be shown in the road layout and hierarchy plan with the site-specific DCP and delivered as part of a future subdivision development application.

The intersection design for Yallah Bay Road and the Princes Highway has been modelled based on future staged scenarios as detailed in the TIA. The intersection design is compatible with the final design and delivery plan for the APRB.

6 Northern Precinct Residential Flat Buildings

DPIE's letter of 25 July 2019 recommended relocation of large lots for potential residential flat buildings from the foreshore of the Northern Precinct to the Central Precinct in the vicinity of the Neighbourhood Business zone.

The conceptual layout and proposed development controls graphics show these adjustments have been made. The large lots in the Northern Precinct are proposed to have the same Height of Buildings and Floor Space Ratio controls as the remainder of the foreshore area (see **Figure 7-4** in **Appendix A** – an extract of which are included in **Figure 6-1** below). The large lots will be available for medium density residential development to maintain a variety of housing styles within the Northern Precinct. These sites are adjacent to the foreshore public open space and shared pathway. The future potential bus service route (an extension of the existing Service Route 33) can have stops on the roads fronting these lots.

Clause 7.14 Minimum site width to Wollongong Local Environmental Plan 2009 (WLEP 2009) requires a minimum site dimension of 24 metres. The conceptual layout shows these lots are capable of compliance. Further specific dimensions will be finalised with a future development application.

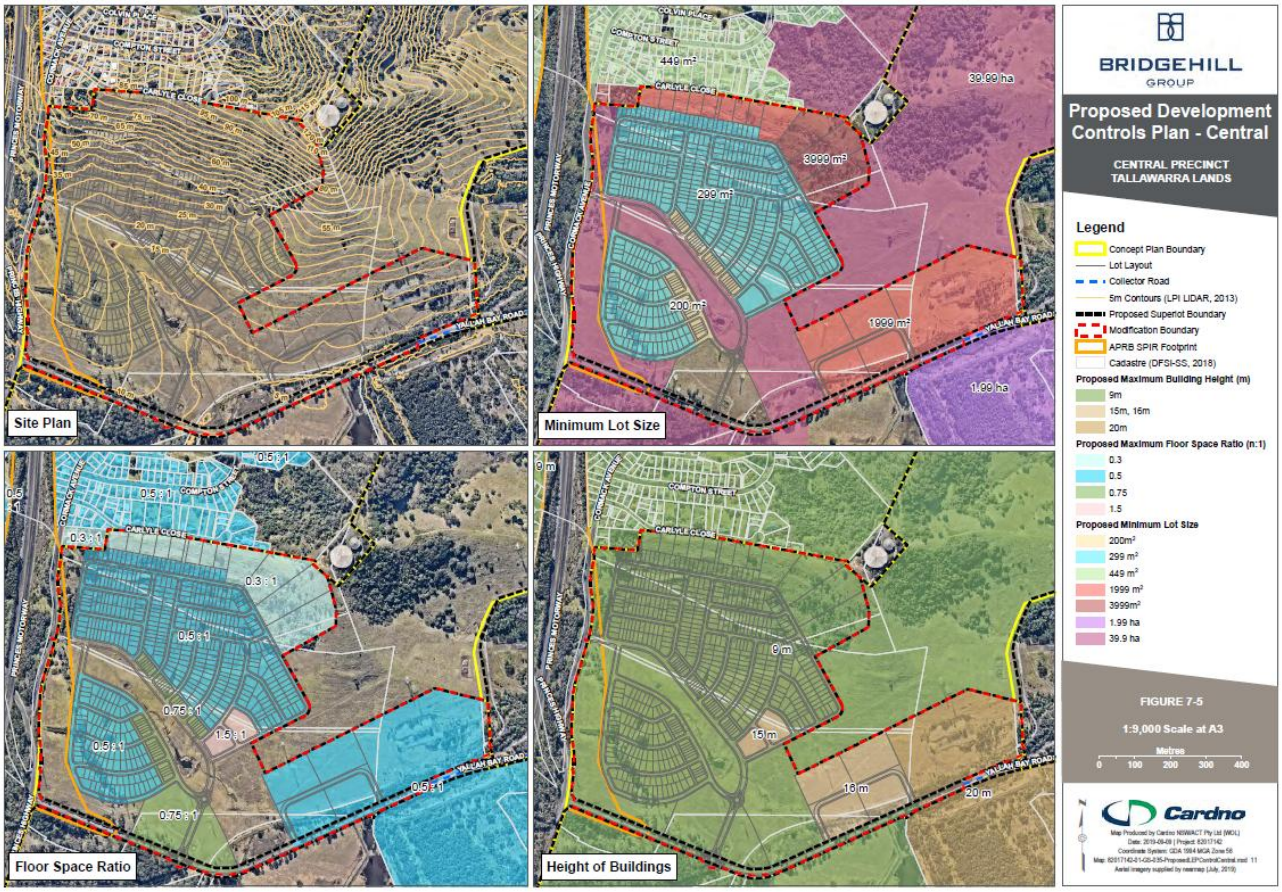
Figure 6-1 Extract of conceptual lot layout (Figure 7-2) and development controls (Figure 7-4) for the foreshore area of the Northern Precinct showing potential medium density allotments

Two large lots suitable for residential flat developments have been added to the Central Precinct (see **Figure 7-5** in **Appendix A** – an extract of which are included in **Figure 6-2** below). The two large lots are less than 400m walking distance to the neighbourhood centre, public playing fields and the restored riparian corridor. They are also within walking distance of the employment lands. The proposed extension to existing Bus Route 43 can travel immediately adjacent to these lots and future bus stops at the neighbourhood centre would be less than 400m from these lots.

The development controls propose a floor space ratio (FSR) of 1.5:1 and a Height of Buildings Control of 15m. *Clause 7.14 Minimum site width* to WLEP 2009 requires a minimum site dimension of 24 metres. The

conceptual layout shows these lots are capable of compliance. Further specific dimensions will be finalised with a future development application.

Figure 6-2 Extract of development controls (Figure 7-5) for that part of the Central Precinct close to the neighbourhood centre showing allotments suitable for residential flats



7 Bushfire

DPIE repeated the concern of NSW RFS regarding the adjoining Council-owned public reserve Lot 1 DP 588318 adjoining the Northern Precinct. Specifically, the RFS stated if a Plan of Management did not apply to this public reserve then a perimeter road along the shared boundary would be recommended.

The Council reserve is identified as Park Reference No. 638 and named Hector Harvey Park. It is classified as Community Land and is subject to Wollongong Council's Generic Plan of Management 2018 for the Community Land of Wollongong City Council (POM 2018). Bushfire hazard management is identified as a management responsibility of Council in the POM 2018. The POM is supported by Council's adopted Bushfire Risk Management Plan and Bushfire Operations Plan. Bushfire hazard management is financed and scheduled through Council's Operational Plan.

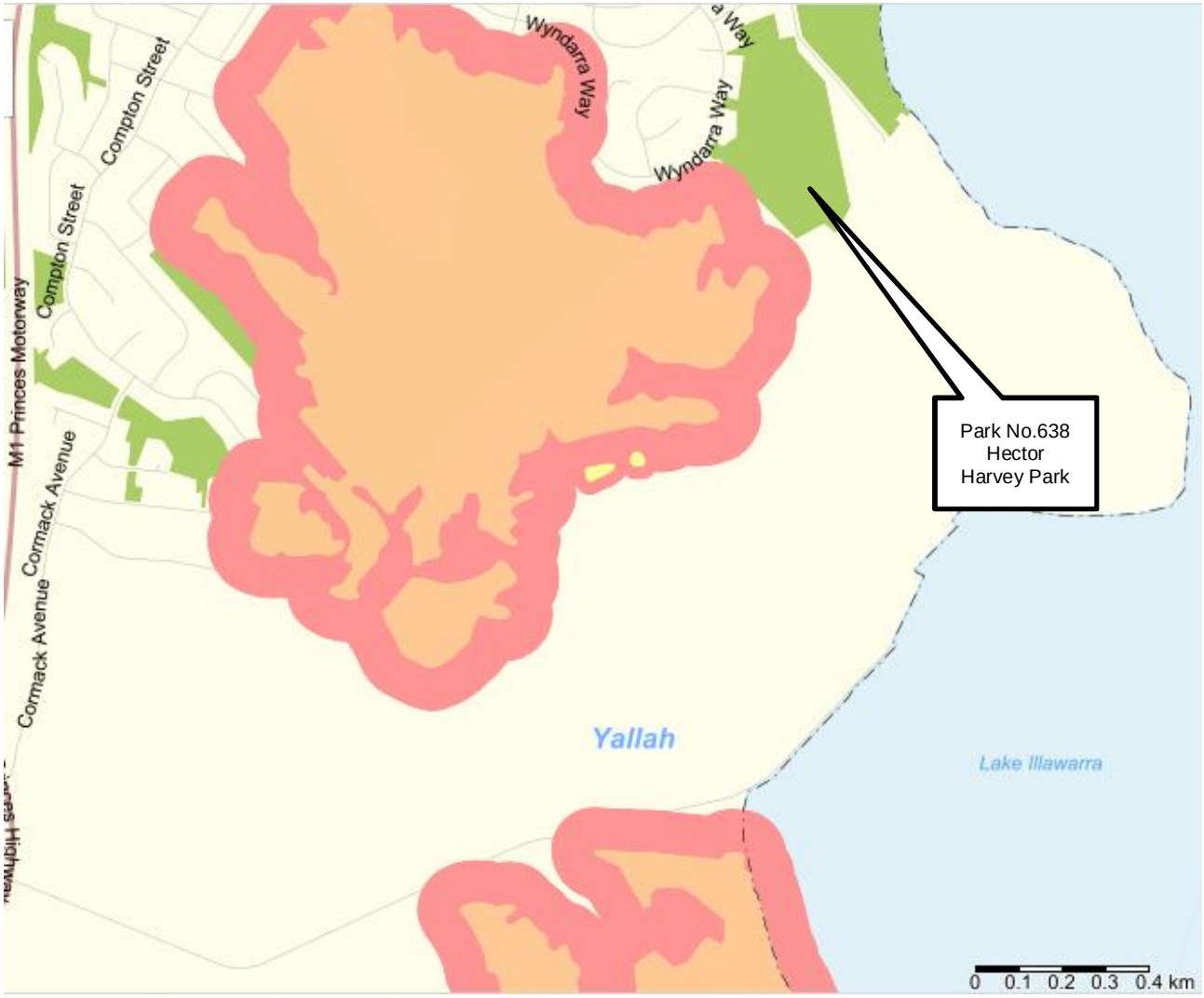
Therefore, the adjoining Community Land is subject to a POM and Council has identified its responsibility to manage bushfire risk on that land.

Furthermore, Bushfire Consultants Peterson Bushfire have reviewed the final conceptual layout for the Northern Precinct. As confirmed in an email from Petersen Bushfire Consultants (see Appendix G) the nearest new dwellings to Park No.638 Hector Harvey Park can be managed in perpetuity with an asset protection zone (APZ). The APZ can be located within the private residential lots adjoining Park No.638. An analysis of slope, aspect and vegetation type by Peterson Bushfire Consulting has confirmed an APZ 10m wide and maintained to an 'inner protection zone' standard would meet the requirements of the NSW RFS Guide '*Planning for Bushfire Protection 2016*'. The email from Peterson Bushfire Consulting is included in **Appendix G**.

APZs would require an area 10m wide within a private lot and adjacent to the boundary shared with Park No.638. The area would be maintained with minimal fuel loads and provide a defendable space between a future dwelling and the potential source of bushfire hazard. A 10m APZ can be registered on the title of a residential lot with prescribed standards for the maintenance of the land. Future residential lots can accommodate a building envelope clear of a 10m APZ at the rear of a lot.

Notwithstanding the above, **Figure 7-1** is an extract from Wollongong Council's Bushfire Prone Land Maps and shows the location of land identified as potential hazard in and adjoining the Tallawarra Lands. Future development applications (other than the first future superlot subdivision application) may be integrated and require concurrence from NSW RFS and the most appropriate measures for bushfire hazard management will be determined with those future DAs.

Figure 7-1 – Extract from Wollongong Bushfire Prone Land Map



8 Other Matters

DPIE's letter of 25 July 2019 acknowledged pending adjustments to the boundaries of the Central and Northern Precincts were anticipated based on:

- Refinement of the land areas subject to future purchase by Bridgehill; and
- Clearance for the protection of Item PAD 52-5-0523

DPIE expressed concern that irregular precinct or allotment boundaries should be avoided.

The adjustment for clearance from PAD 52-5-0523 has not created prominent "irregularities" and is consistent with the requirements of the DPIE (see Figure 2-1).

The adjustments to precinct boundaries to adjust for future ownership transfer are shown in detail in Figures 8-1 and 8-2 below.

Figure 8-1 shows the adjustments made to the Northern Precinct and the total land areas associated with the adjustment. The adjustment is partly within land affected by the noise contours and identified for future public open space. Figure 8-2 shows the adjustments to clarify future land transfer. The area in the north east portion of the Central Precinct has also been adjusted to provide clearance from PAD 52-5-0523 as shown in Figure 2-1.

Figure 8-1 Adjustments to the Northern Precinct boundaries to facilitate land transfer

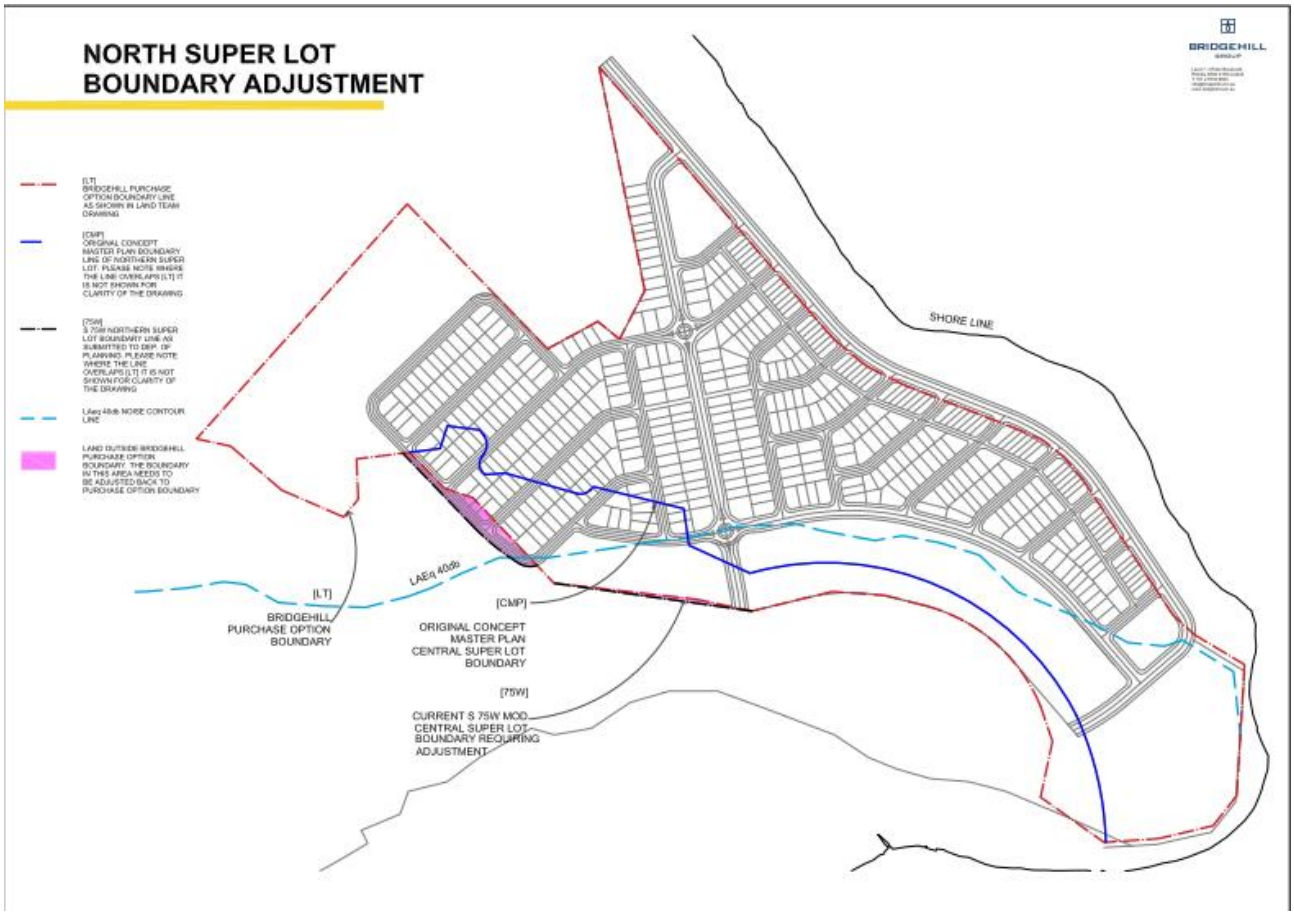
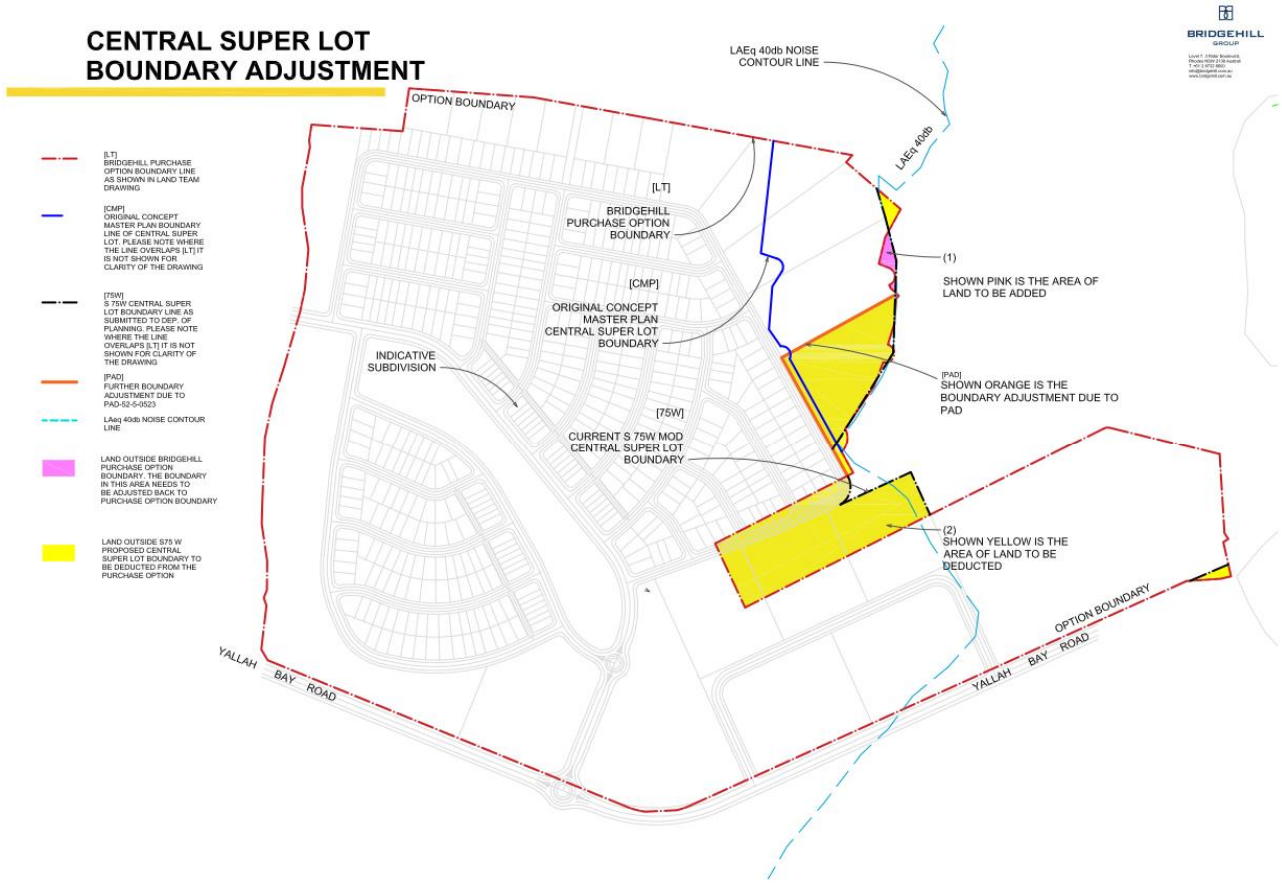


Figure 8-2 Adjustments to the Central Precinct boundaries to facilitate land transfer



The resultant boundaries to the Central and Northern Precinct could not be considered unduly “irregular”. As demonstrated by the conceptual lot layout, the revised boundaries of the Central and Northern Precincts do not have detrimental consequences for potential future lot and road layouts. Road layouts are typically conventional grid and permeable networks responsive to the topography and natural catchment dynamics of the site. Lots are reasonably regular whilst maintaining variety on dimensions, orientation, slope and aspect which further enhances the variety of housing and design responses for future dwellings.

In summary – the final adjustments to the precinct boundaries do not have potential to reduce efficiency of future subdivision, the provision of buildable allotments and the layout of conventional road networks.

9 Non-Key Issues

As requested by DPIE, the non-key issues raised by other agencies in response to the second round of consultation have been summarised in a table in **Appendix F**. As shown in the right hand side column of the table – all issues have been addressed and resolved to the extent possible with this application to modify the Concept Approval. In some cases, the issues raised can only be addressed with subsequent future development applications and where this is the case it is identified in the table.

We trust this information comprehensively addresses the issues raised in the assessment of the modification application and that DPIE are now able to finalise the assessment and determination. Should you require any clarification or additional information please contact me direct or contact the Project Manager Adam Clarke – Manager Civil Infrastructure on Phone (02) 4231 9629 or by email to adam.clarke@cardno.com.au

Yours sincerely,

Sophie Perry
Manager - Planning
for Cardno
Direct Line: 02 4254 8753
Email: sophie.perry@cardno.com.au

Enc: Appendix A
Appendix B
Appendix C
Appendix D
Appendix E
Appendix F
Appendix G
Appendix H

APPENDIX

A

FINAL FIGURES, MAPS AND CONCEPT PLAN
SUPPORTING THE MODIFICATION APPLICATION

ENTRY

NORTH SHORE PRECINCT

CENTRAL PRECINCT

ENTRY

ENTRY

ENTRY

SOUTHERN PRECINCT

LAKE ILLAWARRA

MT BROWN -
EXISTING LANDSCAPE RETENTION

POWER STATION -
SUBJECT TO SEPERATE APPLICATION

CYCLE TRACK

FUTURE DEVELOPMENT AREA

FUTURE TOURISM FACILITY

DUCK CREEK

EXISTING WETLAND RETENTION

EXISTING LAKE RETENTION

LAND USES

- RESIDENTIAL
- HILLSIDE RESIDENTIAL/LARGE LOTS
- LANDSCAPE IMPROVEMENTS
- EMPLOYMENT - NEIGHBOURHOOD CENTRE
- EMPLOYMENT - ENTERPRISE/BUSINESS
- EMPLOYMENT - INDUSTRY/BUSINESS
- RETIREMENT LIVING (POSSIBLE USE)
- PRIMARY SCHOOL (POSSIBLE USE)
- TOURI M

0 100200 300 600m

SCALE 1:6000 @ A1, 1:12000 @ A3

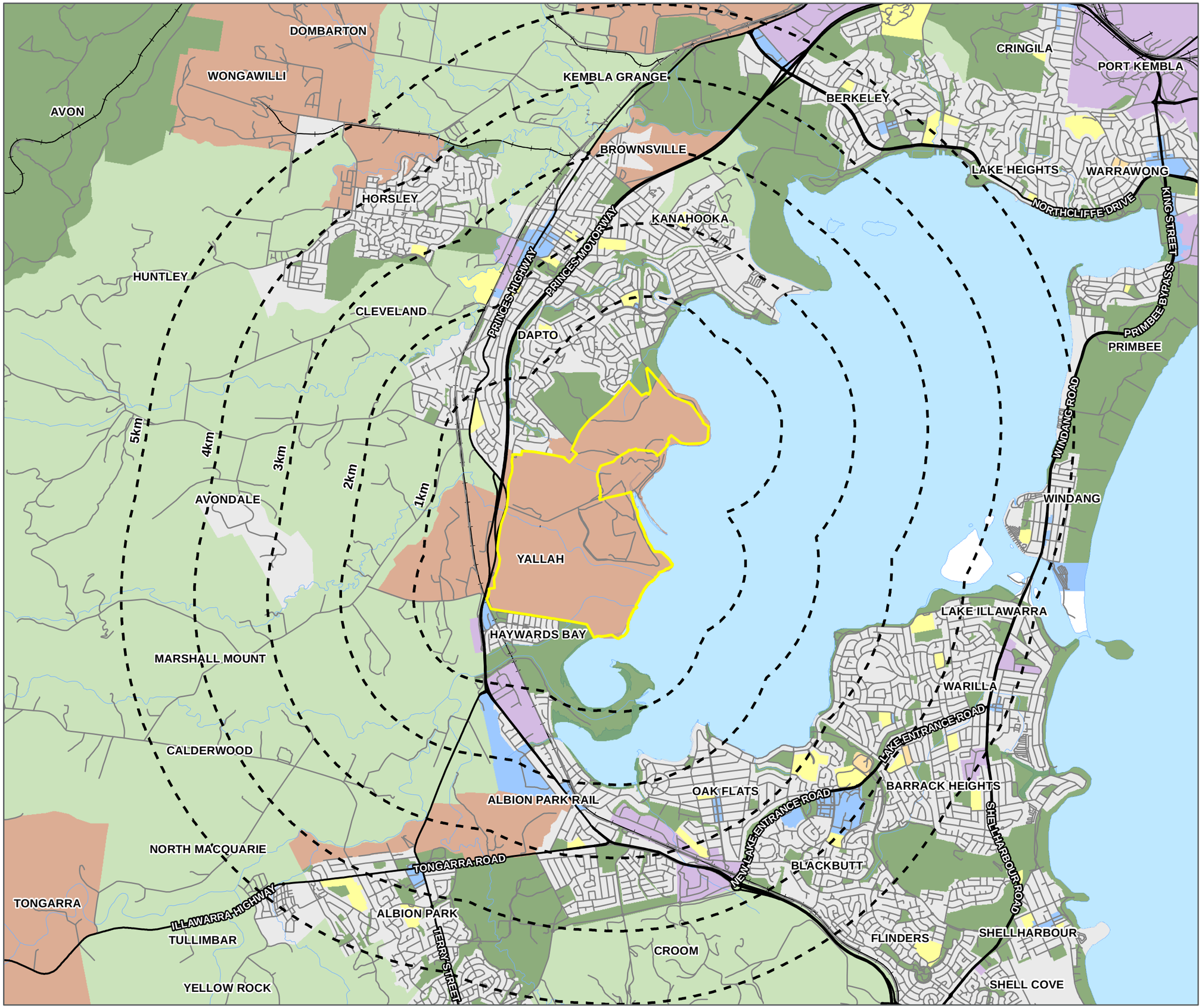
Cardno

landscape architecture
urban design
environmental management

FIGURE 7-5 LANDSCAPE: CONCEPT PLAN

BRIDGEHILL GROUP PTY LTD **TALLAWARRA LANDS**

DATE	PROJECT NO.	DRAWING NO	ISSUE
10.09.19	82019142-02	L1000	DRAFT



BRIDGEHILL GROUP

Locality Plan

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Distance Buffer
- Railway (LPI)
- Local Roads (LPI)
- Major Roads (LPI)
- Major Watercourses (LPI)

Land Use (ABS, 2016)

- Other
- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Primary Production
- Residential
- Water

FIGURE 1-1

1:50,000 Scale at A3

Metres

0 500 1,000 1,500 2,000

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
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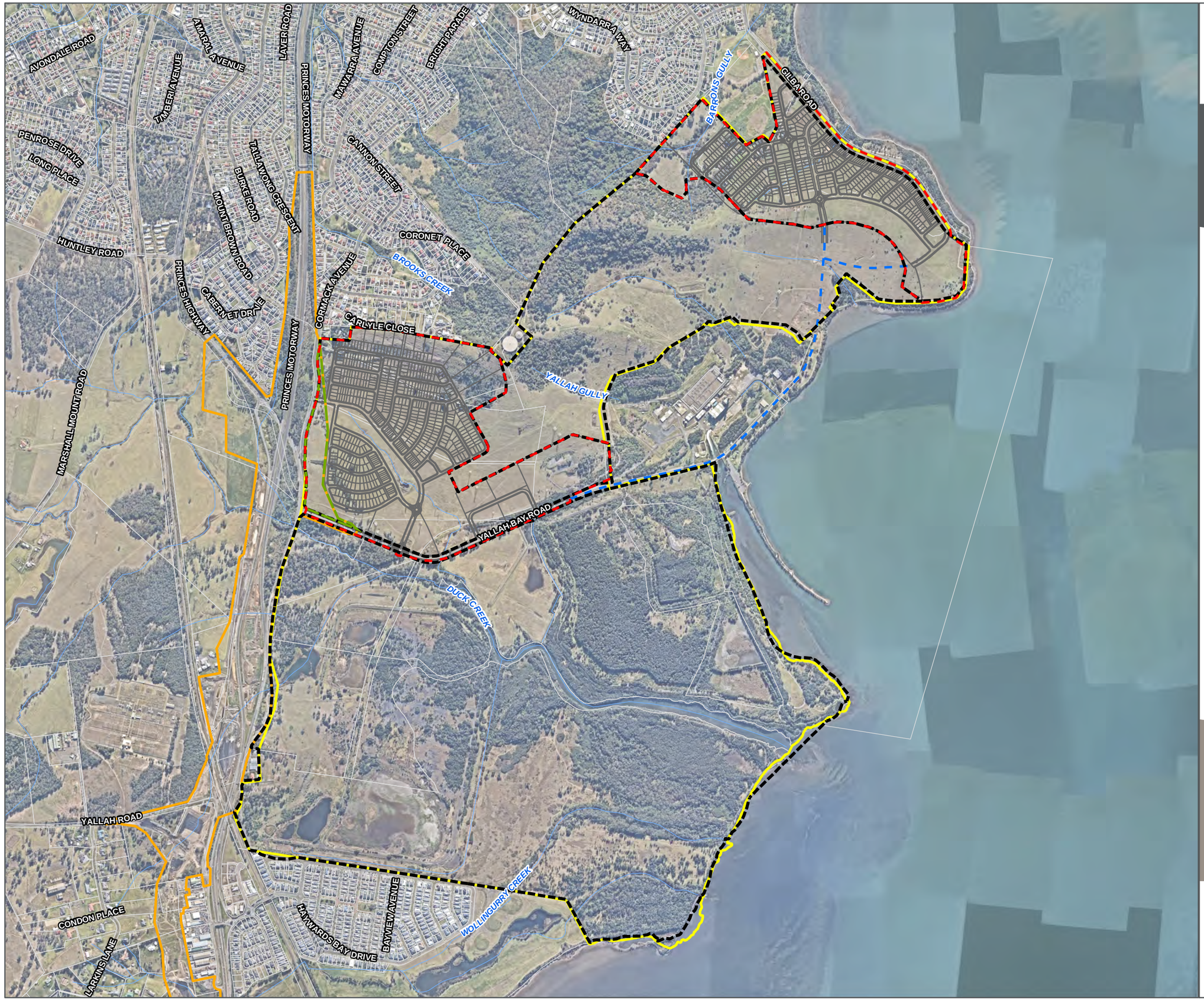
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-026-Locality_Plan.mxd 05



BRIDGEHILL GROUP

Site Plan

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Watercourses (LPI)
- Proposed Superlot Boundary
- Modification Boundary
- Area Excluded From Calculation*
- APRB SPIR Footprint
- Cadastre (DFSI-SS, 2018)

**Area of the modification excluded from calculation. Dedicated for future road reserve.*

FIGURE 1-2

1:15,000 Scale at A3

Metres

0 200 400 600 800

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
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Map: 82017142-01-GS-025-Site_Plan.mxd 14
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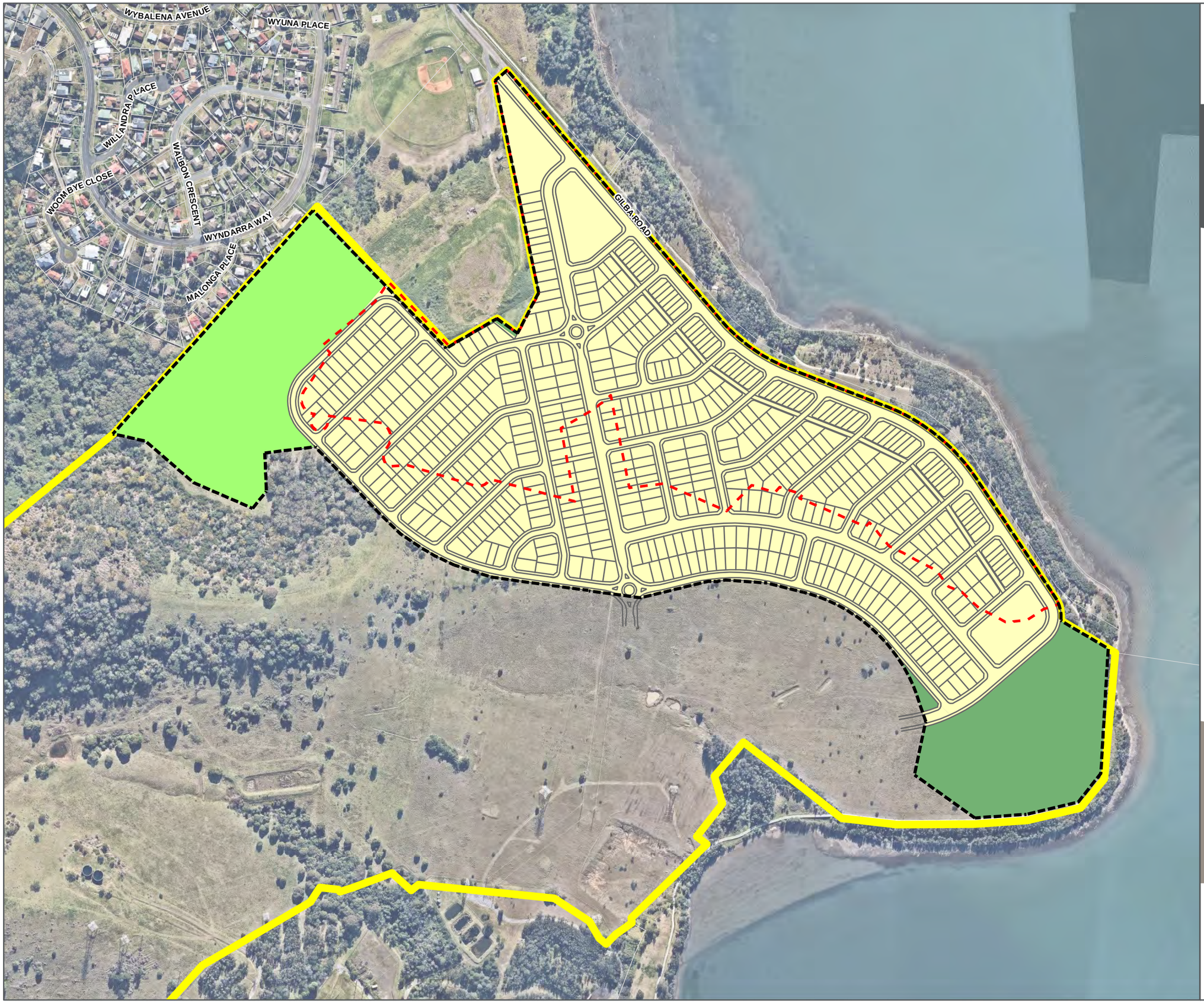

BRIDGEHILL GROUP

Submitted Modified Concept Plan - North

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Proposed Superlot Boundary
- Cadastre (DFSI-SS, 2018)
- Approved Superlot Boundary

Proposed Land Use

- Environmental Lands
- Open Space
- Residential Lands

FIGURE 2-1

1:5,000 Scale at A3

Metres

0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-06 | Project: 82017142
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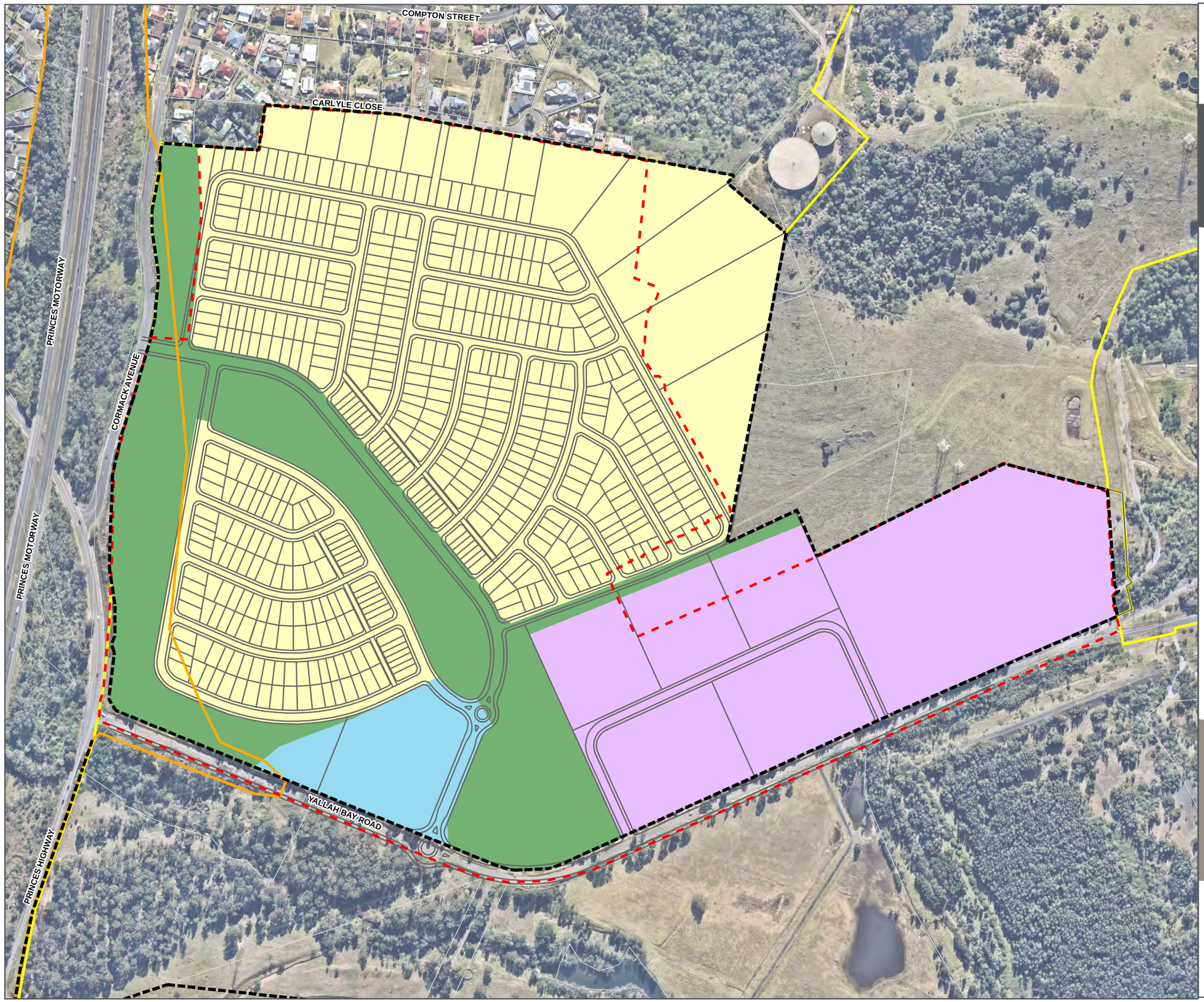
Map: 82017142-01-GS-053-ProposedLandUseNorthShore.mxd 07
Aerial imagery supplied by nearmap (July 2019)



BRIDGEHILL GROUP

Submitted Modified Concept Plan - Central

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Proposed Superlot Boundary
- Approved Superlot Boundary
- Cadastre (DFSI-SS, 2018)
- APRB SPIR Footprint

Proposed Land Use

- Industrial Lands
- Neighbourhood Centre
- Open Space and Environmental Lands
- Residential Lands

FIGURE 2-2

1:4,500 Scale at A3

Metres

0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-06 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-052-ProposedLandUseCentral.mxd 08
Aerial imagery supplied by nearmap (July 2019)

BRIDGEHILL GROUP

Land Ownership

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Watercourses (LPI)
- Proposed Superlot Boundary
- APRB SPIR Footprint
- Cadastre (DFSI-SS, 2018)

Lot / DP	Land Ownership
1 / 1146409	True Energy Tallawarra Pty Ltd
1 / 543285	True Energy Tallawarra Pty Ltd
1 / 551658	True Energy Tallawarra Pty Ltd
7 / 1049520	True Energy Tallawarra Pty Ltd
15 / 1050255	True Energy Tallawarra Pty Ltd
30 / 1175058	True Energy Tallawarra Pty Ltd
31 / 1175058	True Energy Tallawarra Pty Ltd
102 / 716727	True Energy Tallawarra Pty Ltd

FIGURE 5-1

1:9,000 Scale at A3

Metres

0 100 200 300 400

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
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Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-024-Cadastre_Plan.mxd 11
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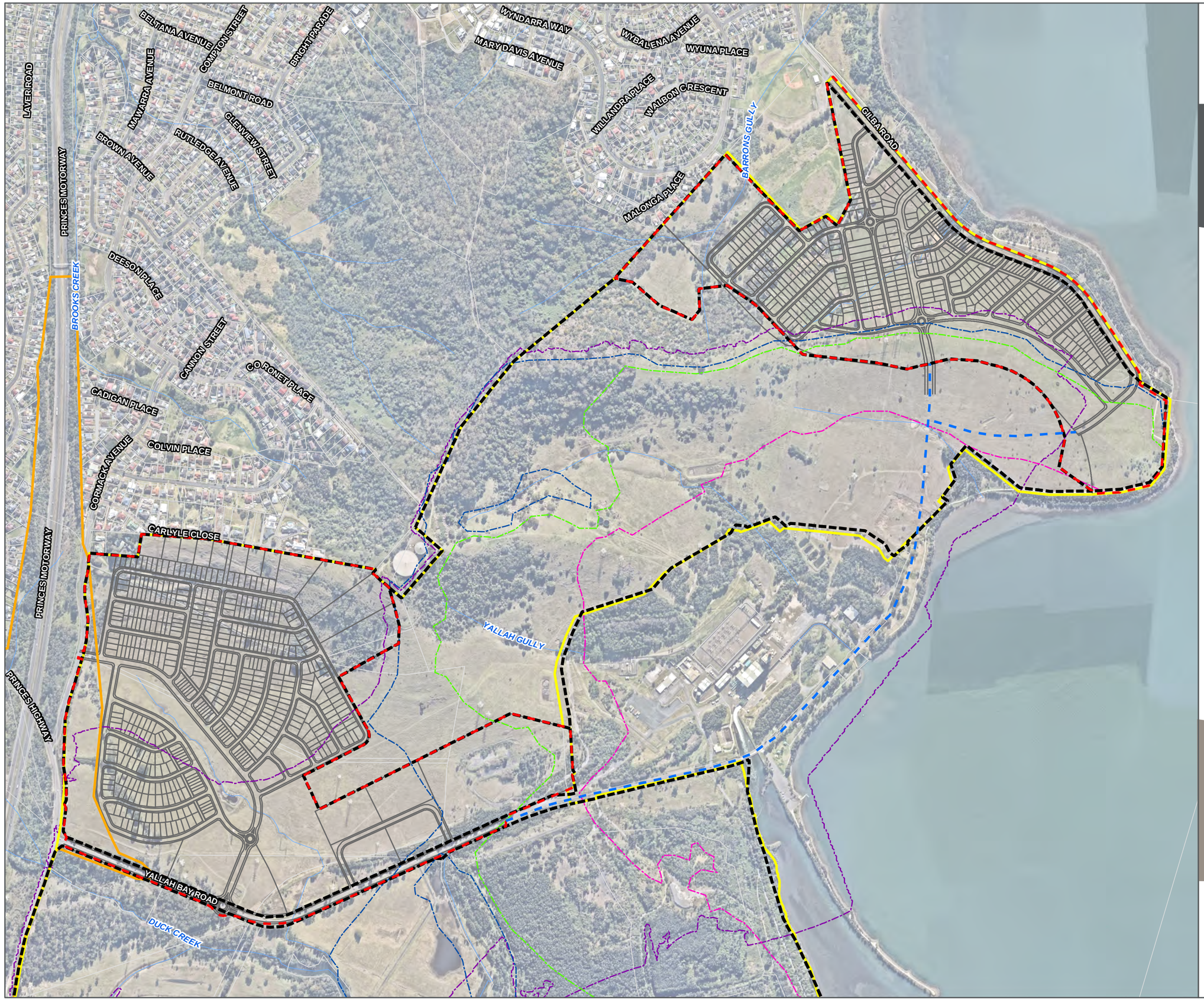

BRIDGEHILL GROUP

Noise Constraints Plan

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Watercourses (LPI)
- Proposed Superlot Boundary
- 50 LAmax (dB (A) SKM, 2011)
- APRB SPIR Footprint
- Modification Boundary
- Cadastre (DFSI-SS, 2018)

Modelled Noise Impacts LAeq Isovalues (Warren Lee Urban Design)

- 40 dbD (A)
- 45 dbD (A)
- 50 dbD (A)

FIGURE 5-10

1:9,000 Scale at A3

Metres

0 100 200 300 400

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
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Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-036-NoiseConstraintPlan.mxd 09
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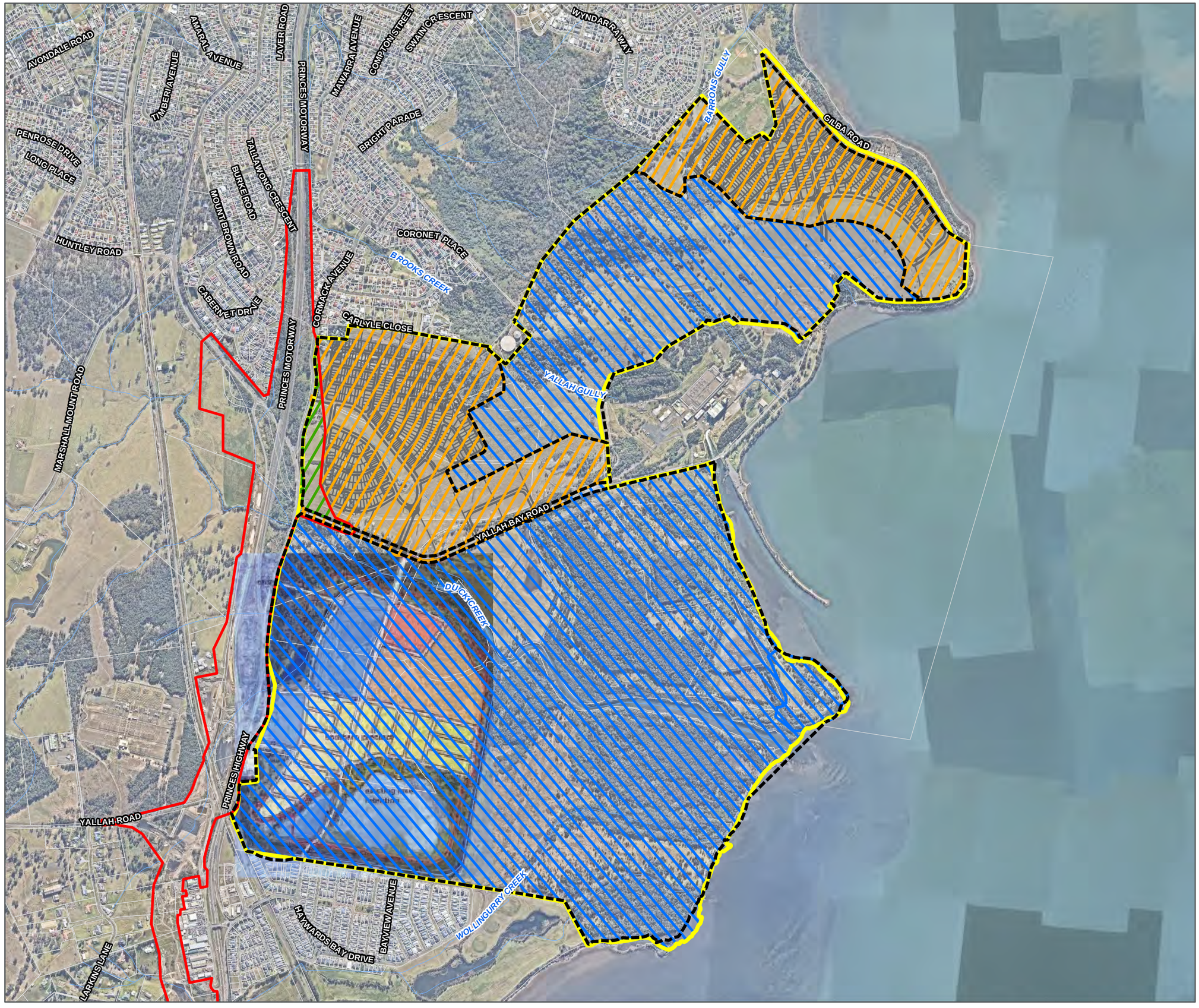

BRIDGEHILL GROUP

Concept Plan - Schedule 3 - Condition 12

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Proposed Superlot Boundary
- Lot Layout
- Watercourses (LPI)
- APRB SPIR Footprint
- Cadastre (DFSI-SS, 2018)
- Excluded Land
- Future Bridgehill Owned Land
- Energy Australia Owned Land

Approved Concept Plan TRUenergy, Tallawarra Lands (LPI, 2015)

FIGURE 5-11

1:15,000 Scale at A3

Metres

0 200 400 600 800

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
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Map: 82017142-01-GS-061-SitePlan_Concept.mxd 10
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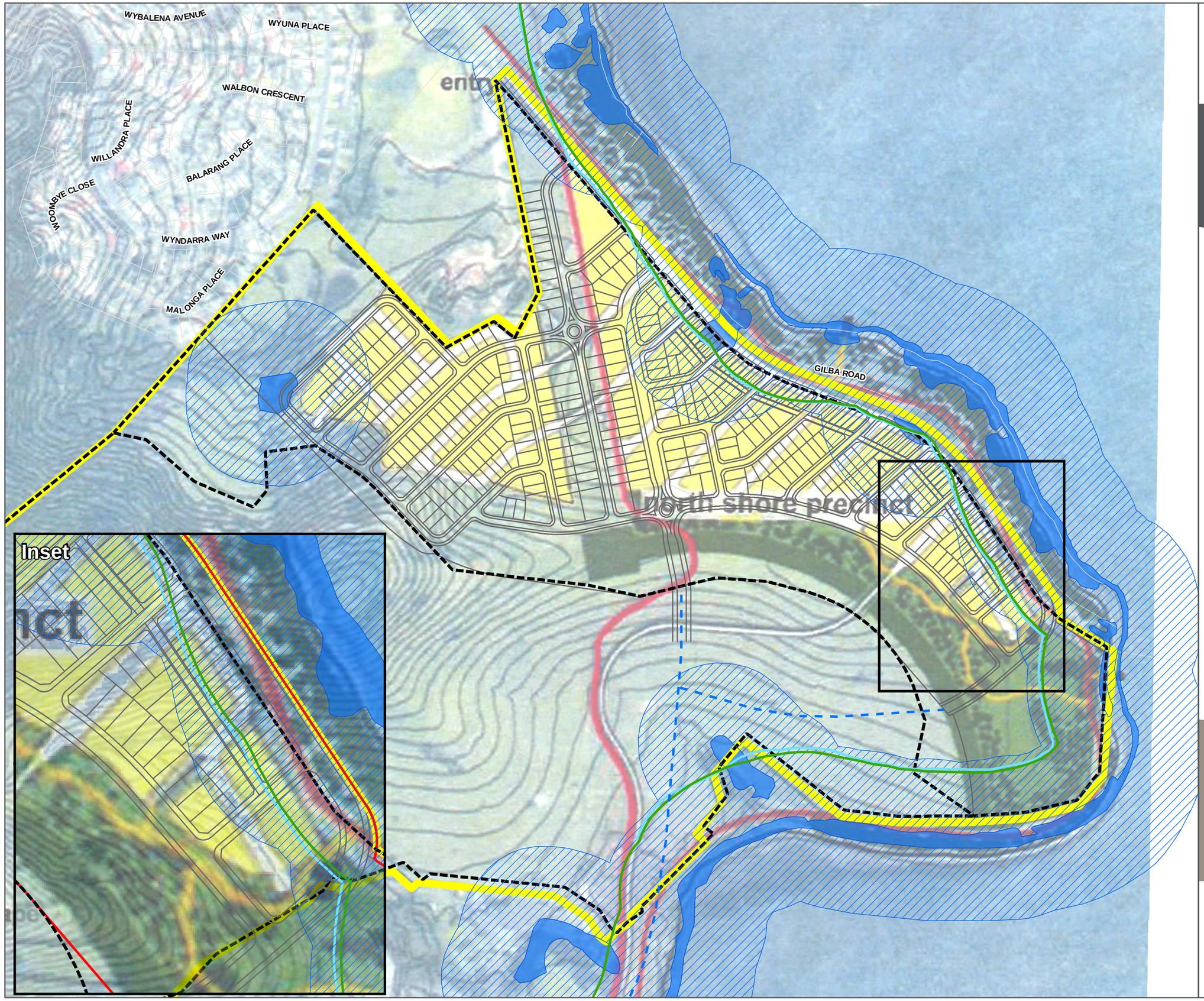


BRIDGEHILL GROUP

Sensitive Coastal Location Extents - North

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Proposed Superlot Boundary
- 100m High Water Mark Buffer*
- 100m Waters Edge Buffer**
- Cadastre (DFSI-SS, 2018)

Coastal Management SEPP (OEH, 2018)

- Coastal Wetlands
- Coastal Wetlands Proximity Area

*100m High Water Mark Buffer from 0.25m contour derived from 2013 LiDAR (NSW LPI)
**100m Waters Edge Buffer generated from NSW LPI Hydro Area (DTDB)

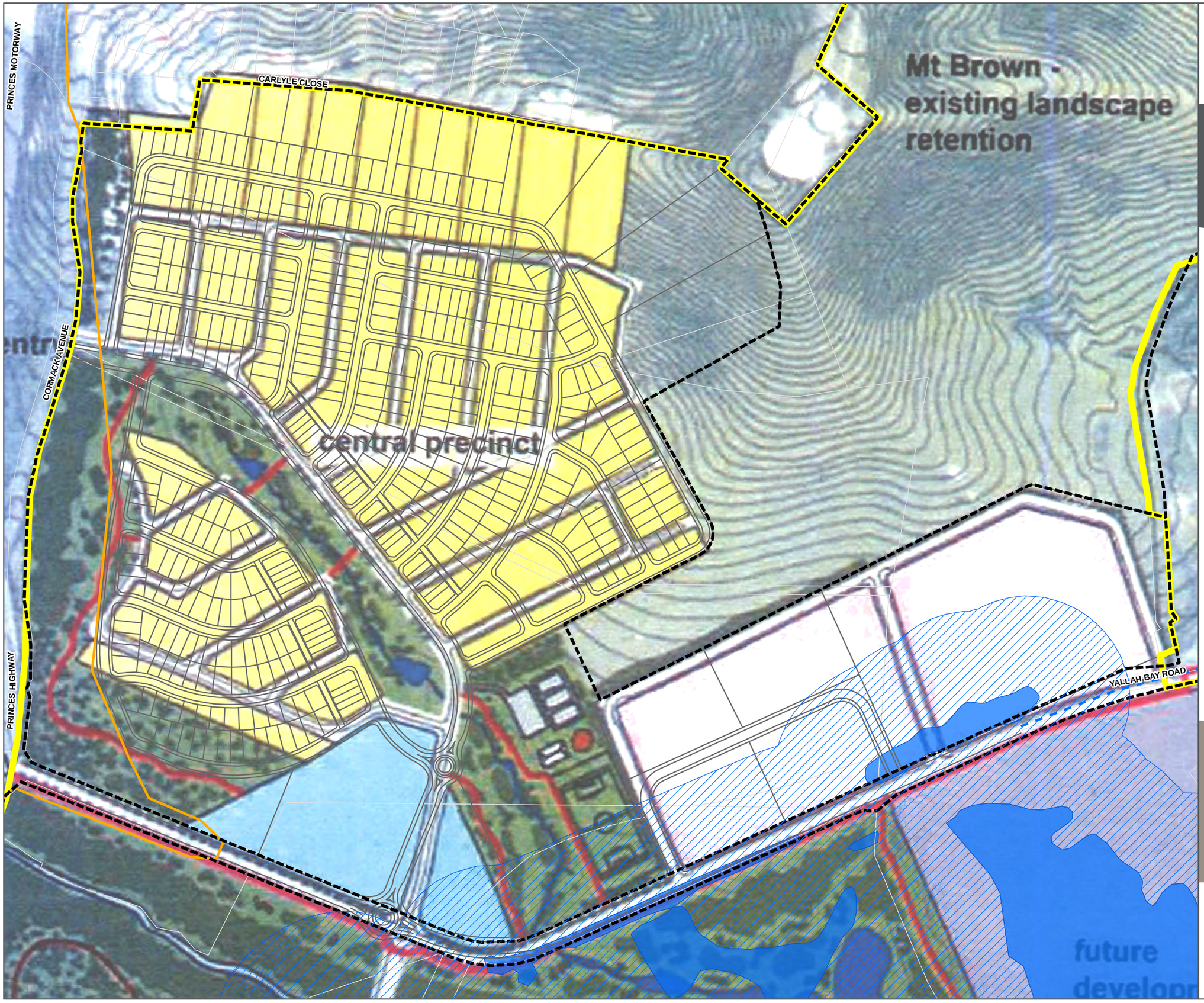
FIGURE 5-2

1:5,000 Scale at A3

Metres
0 50 100 150 200

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-062-CoastalSEPPBufferZones.mxd 12
Basemap from Tallawarra Concept Plan (2012)



BRIDGEHILL GROUP

Sensitive Coastal Location Extents - Central

TALLAWARRA LANDS

Legend

- Collector Road
- Proposed Superlot Boundary
- APRB SPIR Footprint
- Concept Plan Boundary
- Cadastre (DFSI-SS, 2018)

Coastal Management SEPP (OEH 2018)

- Coastal Wetlands
- Coastal Wetlands Proximity Area

FIGURE 5-3

1:4,000 Scale at A3

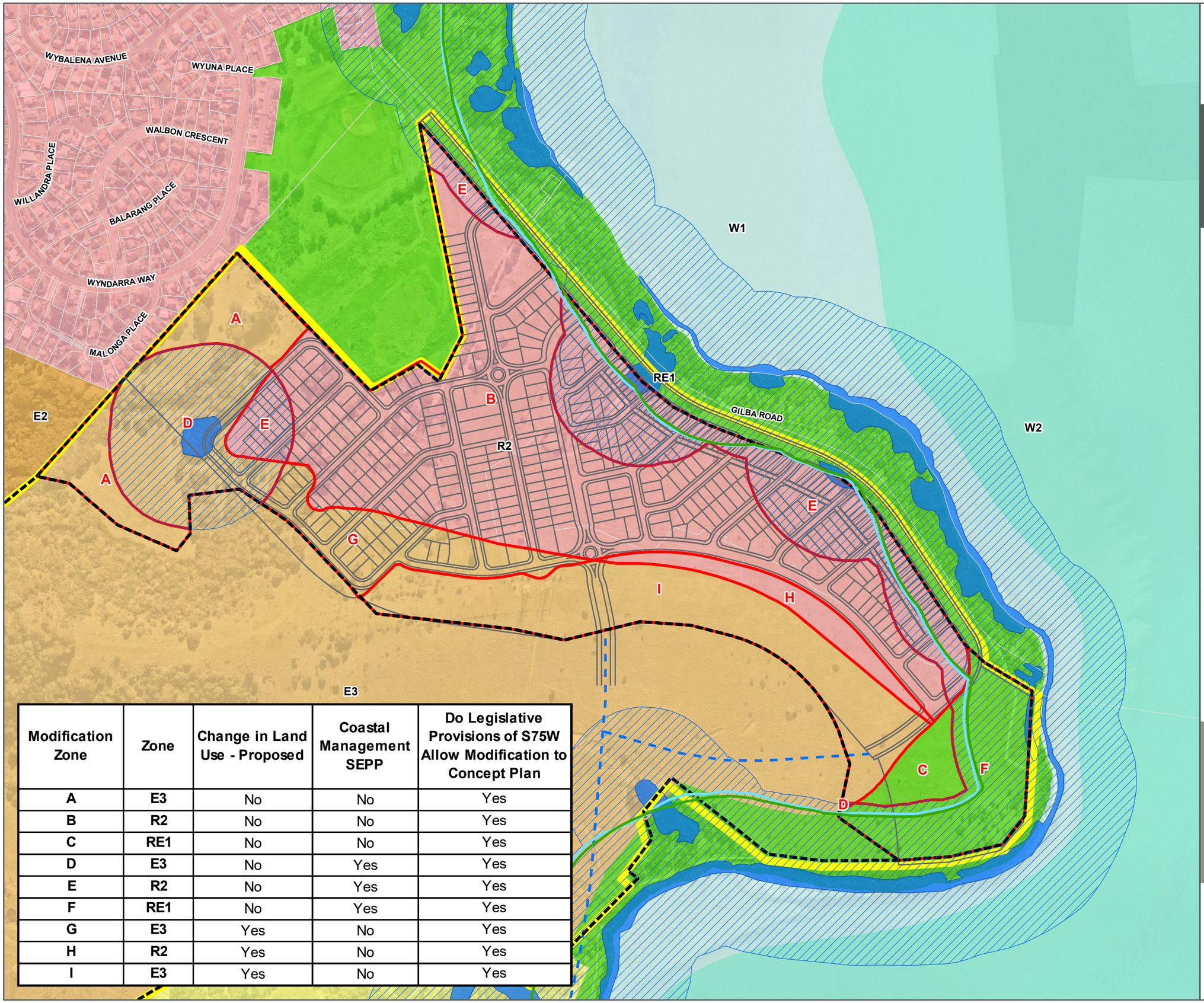
Metres

0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-067-CoastalSEPPBufferZonesCen.mxd 06
Basemap from Tallawarra Concept Plan (2012)



Modification Zone	Zone	Change in Land Use - Proposed	Coastal Management SEPP	Do Legislative Provisions of S75W Allow Modification to Concept Plan
A	E3	No	No	Yes
B	R2	No	No	Yes
C	RE1	No	No	Yes
D	E3	No	Yes	Yes
E	R2	No	Yes	Yes
F	RE1	No	Yes	Yes
G	E3	Yes	No	Yes
H	R2	Yes	No	Yes
I	E3	Yes	No	Yes

BRIDGEHILL GROUP

Northern Precinct Modification Permissibility

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Proposed Superlot Boundary
- 100m High Water Mark Buffer*
- 100m Waters Edge Buffer**
- Cadastre (DFSI-SS, 2018)
- Zoning Lines

Coastal Management SEPP (OEH 2018)

- Coastal Wetlands
- Coastal Wetlands Proximity Area

Zoning - Wollongong LEP 2009 (DPE, July 2018)

- E2 - Environmental Conservation
- E3 - Environmental Management
- R2 - Low Density Residential
- RE1 - Public Recreation
- SP2 - Infrastructure
- W1 - Natural Waterways
- W2 - Recreational Waterways

Note: Zoning lines show extent of modified or retained zoning.The extent of modification to zoning should be read in conjunction with the zoning table.

**100m High Water Mark Buffer from 0.25m contour derived from 2013 LiDAR (NSW LPI)*
***100m Waters Edge Buffer generated from NSW LPI Hydro Area (DTDB)*

FIGURE 5-4

1:5,000 Scale at A3

Metres

0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-068-NP_Modification.mxd 09
Aerial imagery supplied by nearmap (July, 2019)

Modification Zone	Zone	Change in Land Use - Proposed	Coastal Management SEPP	Do Legislative Provisions of S75W Allow Modification to Concept Plan
A	E3	No	No	Yes
B	R2	No	No	Yes
C	IN2	No	No	Yes
D	B1	No	No	Yes
E	R5	No	No	Yes
F	IN1	No	No	Yes
G	E3	Yes	No	Yes
H	R2	Yes	No	Yes
J	B1	No	No	Yes
K	R5	Yes	No	Yes
L	IN1	Yes	No	Yes
M	E3	No	Yes	Yes
N	IN2	No	Yes	Yes
O	B1	No	Yes	Yes
P	IN2	No	Yes	Yes
Q	IN2	No	No	Yes
R	IN2	No	Yes	Yes

BRIDGEHILL GROUP

Central Precinct Modification Permissibility

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Proposed Superlot Boundary
- APRB SPIR Footprint
- Cadastre (DFSI-SS, 2018)
- Zoning Lines

Coastal Management SEPP (OEH 2018)

- Coastal Wetlands
- Coastal Wetlands Proximity Area

Zoning - Wollongong LEP 2009 (DPE, July 2018)

- B1 - Neighbourhood Centre
- B6 - Enterprise Corridor
- E2 - Environmental Conservation
- E3 - Environmental Management
- E4 - Environmental Living
- IN1 - General Industrial
- IN2 - Light Industrial
- R2 - Low Density Residential
- R5 - Large Lot Residential
- RE1 - Public Recreation
- SP2 - Infrastructure

Note: Zoning lines show extent of modified or retained zoning.The extent of modification to zoning should be read in conjunction with the zoning table.

FIGURE 5-5

1:5,000 Scale at A3

Metres 0 50 100 150 200

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-069-CP_Modification.mxd 07
Aerial imagery supplied by nearmap (July, 2019)

BRIDGEHILL GROUP

Albion Park Rail Bypass Extents

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Major Road (LPI)
- Watercourses (LPI)
- Cadastre (DFSI-SS, 2018)
- Modification Boundary
- APRB SPIR Footprint

FIGURE 5-6

1:15,000 Scale at A3

Metres

0 200 400 600 800

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-063-APRB_Extents.mxd 08
Aerial imagery supplied by nearmap (July, 2019)

BRIDGEHILL GROUP

Proposed Road Hierarchy - Central & Northern Precincts

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Watercourse (LPI)
- Proposed Superlot Boundary
- Modification Boundary
- APRB SPIR Footprint
- Cadastre (DFSI-SS, 2018)

Proposed Road Hierarchy

- Collector Road - Minor / Major (22.4m)
- Collector Road - Minor (20.4m)
- Local Street - Major (17.0m)
- Local Street - Minor (14.5m)
- Access Lane (8.0m)

FIGURE 5-7

1:9,000 Scale at A3

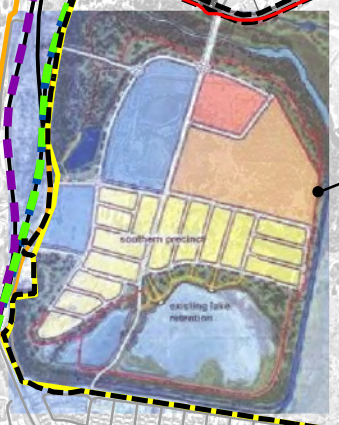
Metres

0 100 200 300 400

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 82017142O1
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-058-ProposedRoadHierachy.mxd 09
Aerial imagery supplied by nearmap (July, 2019)

BONG BONG ROAD
BROOKS REACH ROAD
EXMOUTH ROAD
THIRROUL ROAD
KANAHOOKA ROAD
BYAMEE STREET
PRINCES MOTORWAY
PRINCES MOTORWAY
LAKELANDS DRIVE
WINDARRA WAY
COMPTON STREET
AVONDALE ROAD
PRINCES HIGHWAY
ILLAWARRA HIGHWAY
DEAKIN STREET
INDUSTRIAL ROAD
PRINCES HIGHWAY



Tallawarra Lands Approved Concept Plan (TRUenergy, 2012)

Legend

- Concept Plan Boundary
- Bus Stop (TfNSW, 2018)
- Lot Layout
- Major Road (LPI)
- Collector Road
- Proposed Superlot Boundary
- Modification Boundary
- APRB SPIR Footprint

Bus Route (TfNSW, 2018)

- 31
- 32
- 33
- 37
- 41
- 43
- 51
- 53
- 57
- 71
- 75
- 76
- 77

BRIDGEHILL GROUP

1:25,000 Scale at A3

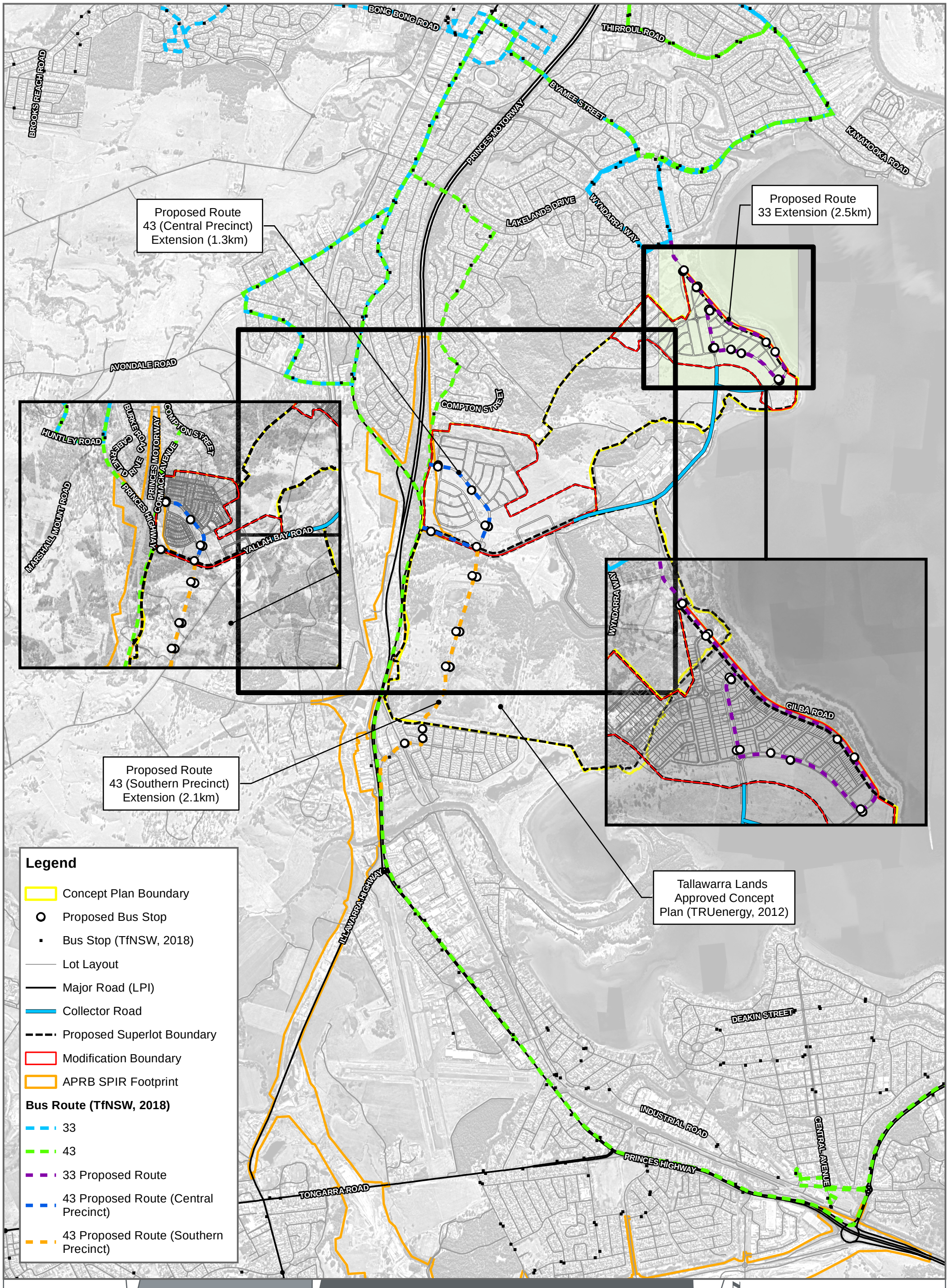
m
0 250 500 750 1,000

Existing Bus Network

TALLAWARRA LANDS

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-059-ExistingBusRoutePlanning.mxd 09
Aerial imagery supplied by nearmap (July, 2019)



BRIDGEHILL GROUP

1:25,000 Scale at A3

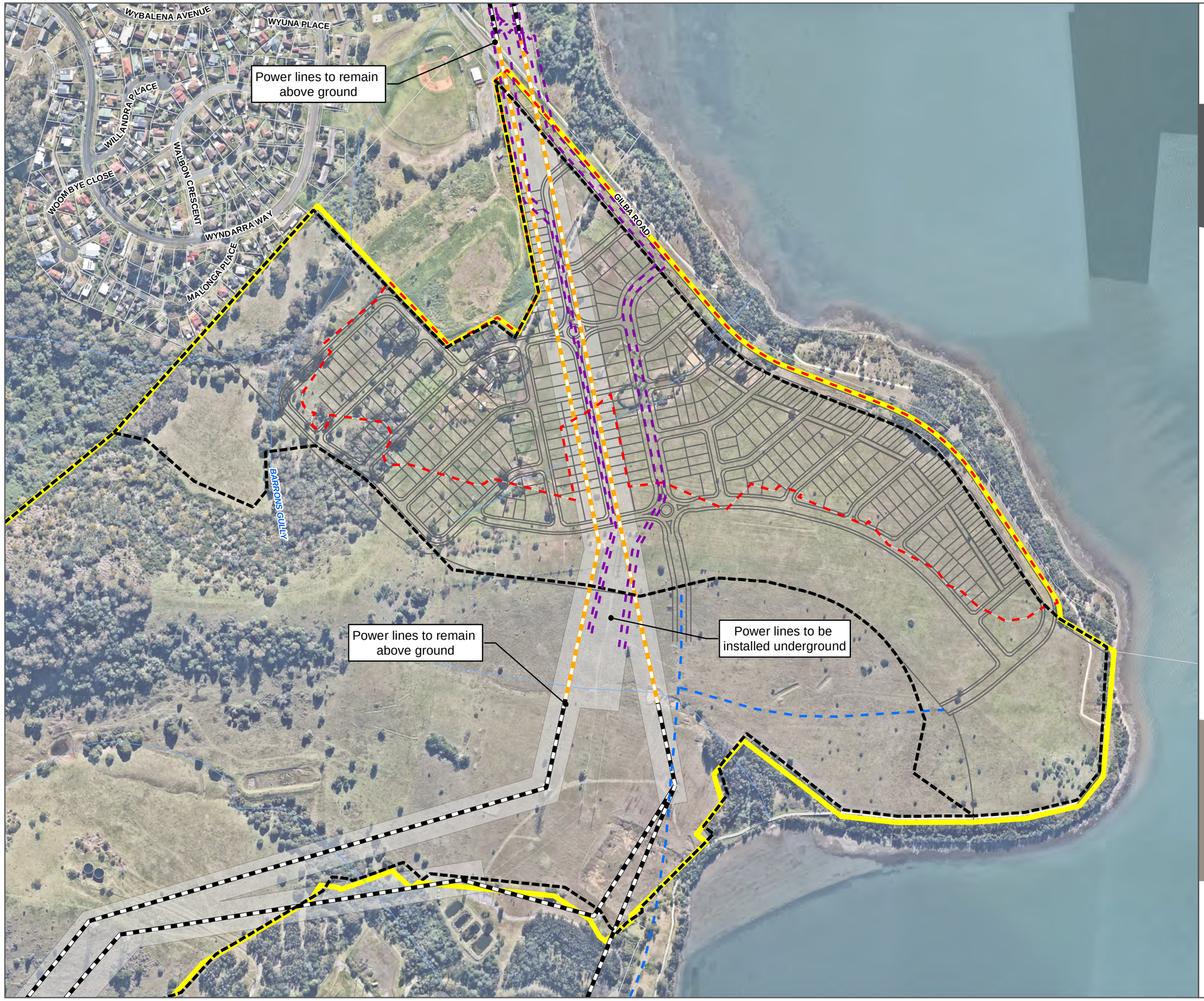
m 0 250 500 750 1,000

Proposed Bus Network

TALLAWARRA LANDS

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-060-ProposedBusRoutePlanning.mxd 08
Aerial imagery supplied by nearmap (July, 2019)



BRIDGEHILL GROUP

Proposed Transmission Line

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Watercourses (LPI)
- Collector Road
- Proposed Superlot Boundary
- Proposed Underground Transmission
- Existing Overhead Electricity Transmission Line (LPI)
- Extent of Existing Overhead Electricity Transmission Line to be moved underground
- Easement (LPI)
- Cadastre (DFSI-SS, 2018)
- Concept Approval Boundary

FIGURE 7-1

1:5,000 Scale at A3

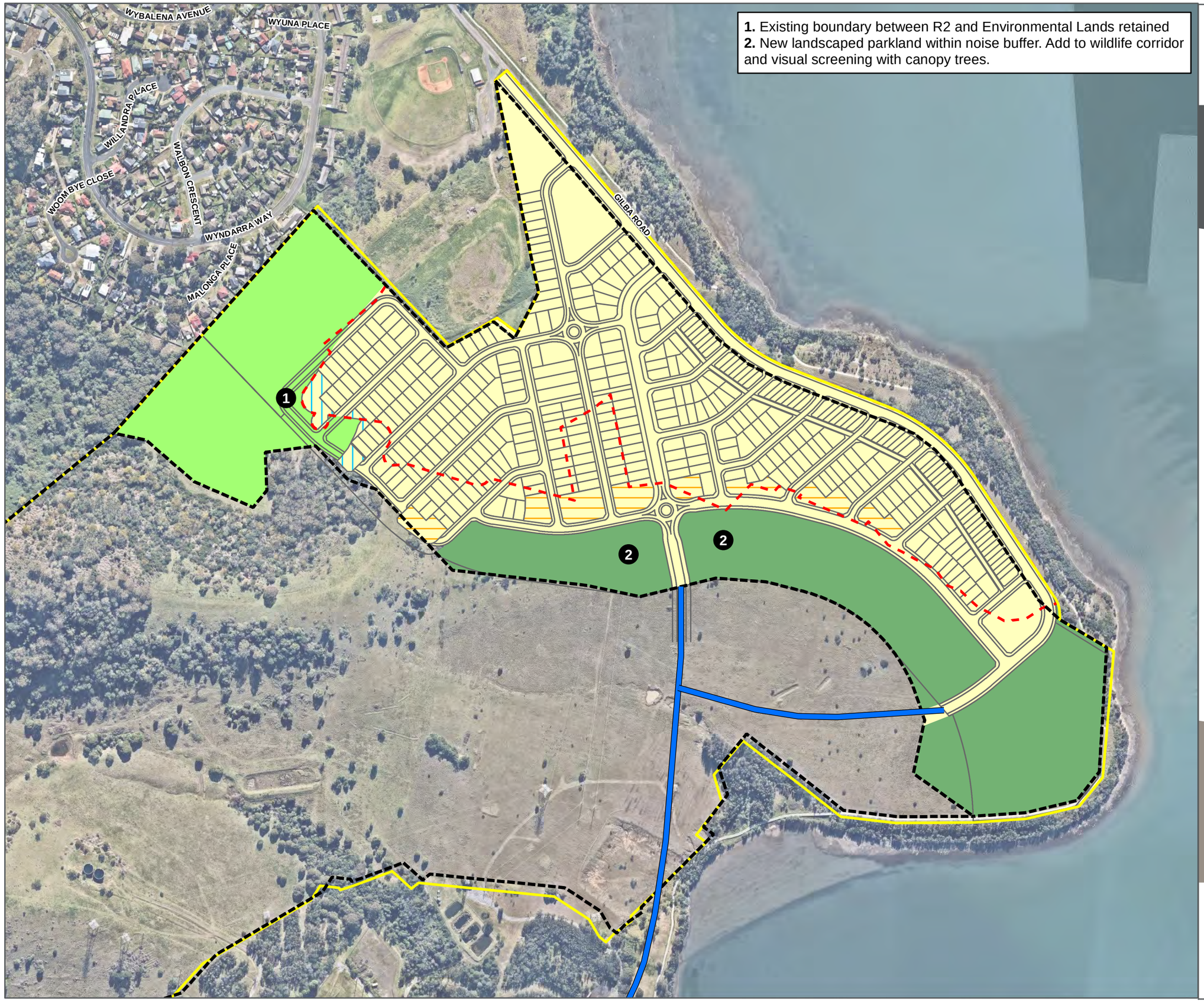
Metres

0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-070-PropTransmissionLine.mxd 07
Aerial imagery supplied by nearmap (July, 2019)



1. Existing boundary between R2 and Environmental Lands retained
2. New landscaped parkland within noise buffer. Add to wildlife corridor and visual screening with canopy trees.

BRIDGEHILL GROUP

Final Concept Plan North

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Proposed Superlot Boundary
- Approved Superlot Boundary

Proposed Land Use

- Environmental Lands - Zone E3
- Open Space - Zone RE1
- Residential Lands - Zone R2
- Residential Lands - Larger Lots (Noise Mitigation) - Zone R2*
- Residential Lands - Larger Lots (Coastal Wetland - Zone R2

** Larger lots provided until certainty around Tallawarra "B" power station timing is confirmed*

FIGURE 7-2

1:5,000 Scale at A3

Metres
0 50 100 150 200

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-09 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-064-ModifiedConceptPlan_N.mxd 11
Aerial imagery supplied by nearmap (July, 2019)

1. Albion Park Rail Bypass removed from open space
2. Increased open space adjoining neighbourhood centre (B1)
3. Consolidated B1 for "gateway" accessible neighbourhood centre and neighbourhood shops
4. Open space and environmental lands to buffer between residential and industrial and restore watercourse
5. Additional IN1/IN2 for mixed industrial lands
6. Reduce large lot for noise buffer to power station
7. New opportunities for housing density central to shops, employment and amenities
8. Space in road reserve for noise wall

COMPTON STREET
CARLYLE CLOSE
PRINCES MOTORWAY
CORMACK AVENUE
YALLAH BAY ROAD
PRINCES HIGHWAY

BRIDGEHILL GROUP

Final Concept Plan Central

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- Proposed Superlot Boundary
- Approved Superlot Boundary
- APRB SPIR Footprint
- Cadastre (DFSI-SS, 2018)

Proposed Land Use

- General Industrial Lands
- Light Industrial Lands
- Neighbourhood Centre
- Environmental Lands
- Residential Lands
- Large Lot Residential Lands

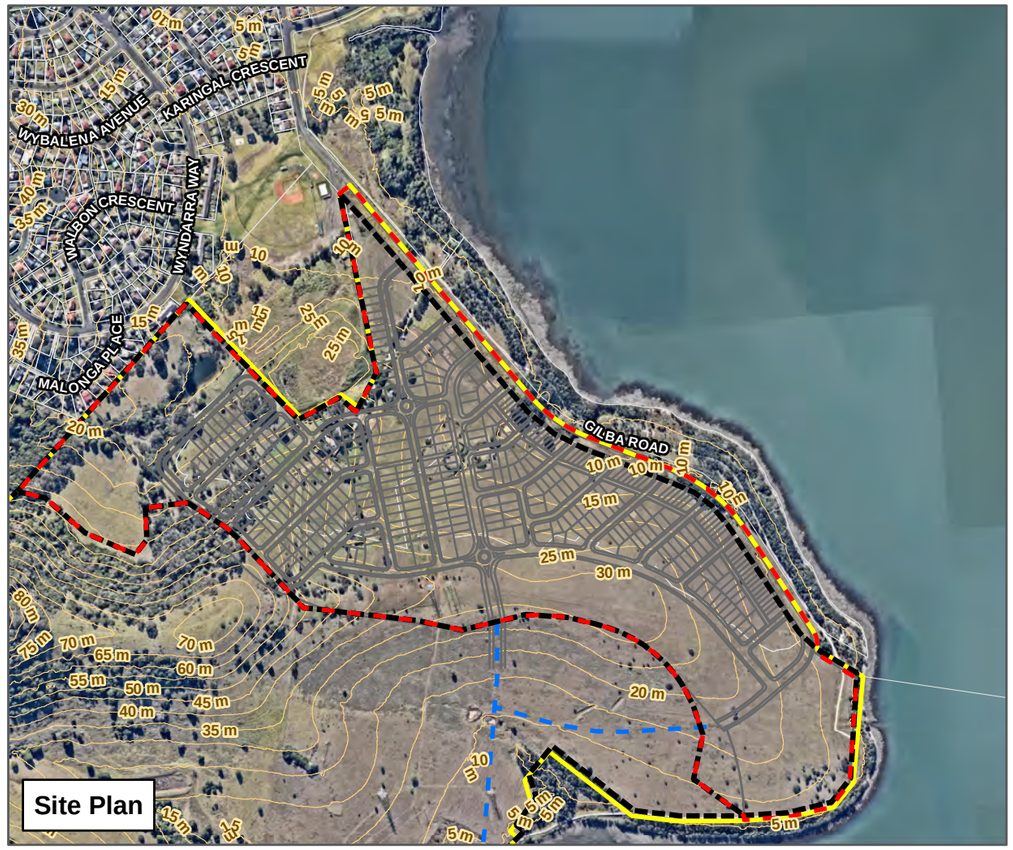
FIGURE 7-3

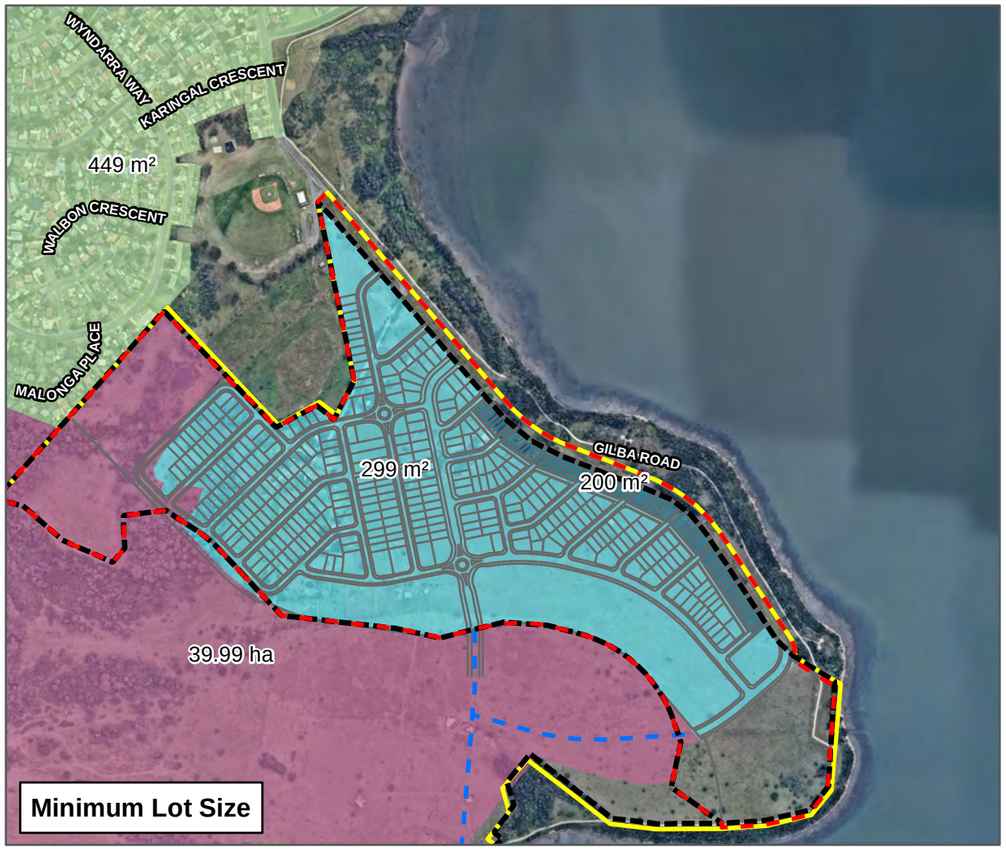
1:4,500 Scale at A3

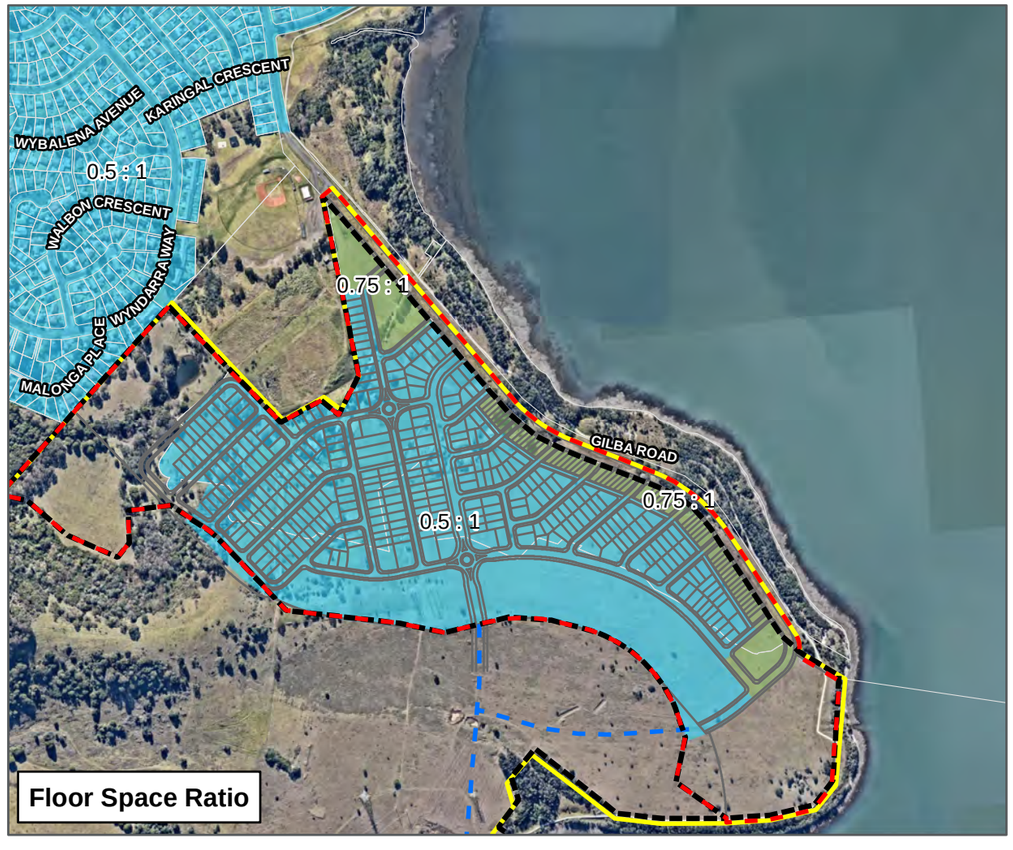
Metres
0 50 100 150 200

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-11 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-065-ModifiedConceptPlan_C.mxd 09
Aerial imagery supplied by nearmap (July, 2019)







BRIDGEHILL GROUP

Proposed Development Controls Plan - North

NORTH SHORE PRECINCT
TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Lot Layout
- Collector Road
- 5m Contours (LPI LiDAR, 2013)
- Proposed Superlot Boundary
- Modification Boundary
- Cadastre (DFSI-SS, 2018)

Proposed Maximum Floor Space Ratio (n:1)

- 0.5
- 0.75

Proposed Maximum Building Height (m)

- 9m

Proposed Minimum Lot Size

- 200 m²
- 299 m²
- 449 m²
- 39.99 ha

FIGURE 7-4

1:10,000 Scale at A3

Metres
0 100 200 300 400

N

Cardno

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2019-09-12 | Project: 82017142
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-034-ProposedLEPControlNorth.mxd 12
Aerial imagery supplied by nearmap (July, 2019)

APPENDIX

B

PROPOSED MODIFIED SET OF CONDITIONS

APPENDIX B – Schedule of modified conditions for the Concept Approval

The following table is a list of the conditions of the Concept Approval that are requested to be modified.

Only those conditions requested to be modified are listed in the table.

Modifications are presented in 'track 'changes' format with strikethrough text to be deleted and underlined text to be added.

ORIGINAL CONCEPT APPROVAL	PROPOSED MODIFICATION	JUSTIFICATION
SCHEDULE 2		
PART A – TERMS OF APPROVAL		
A1 Development description Concept approval is granted to the development as described below; (a) Three residential precincts accommodating up to 1,010 lots – the Northshore Precinct, Central Precinct and the Lakeside (southern) Precinct; (b) Lands for a neighbourhood centre within the Central precinct; (c) Lands for a future tourism facility on the eastern headland of the Central precinct; (d) Lands within the central and southern precincts for industrial, light industrial and business purposes; (e) An internal road network, a network walkways, cycle paths, share paths; and (f) Open space, public recreation areas and conservation lands.	**A1 Development description** Concept approval is granted to the development as described below; (a) Three residential precincts accommodating up to ~~1,010~~ 1,257 lots – the North<u>ern</u> ~~shore~~ Precinct, Central Precinct and the Lakeside (southern) Precinct; (b) Lands for a neighbourhood centre within the Central precinct; (c) Lands for a future tourism facility on the eastern headland of the Central precinct; (d) Lands within the central and southern precincts for industrial, light industrial and business purposes; (e) An internal road network, a network <u>of</u> walkways, cycle paths, share paths; and (f) Open space, public recreation areas and conservation lands.	The number of residential lots is changed to accurately reflect the conceptual subdivision layout. The label of the northern precinct has changed from the "Northshore Precinct" to the "Northern Precinct" to match the wording on the revised Concept Plan. (e) subject to a minor typographical correction to replace "network walkways" with "network of walkways" There are no changes to the layout south of Yallah Bay Road. The link road between Haywards Bay and Yallah Bay Road remains an essential element of the future development of the land south of Yallah Bay Road. There are no changes to the general alignment of Yallah Bay Road. The land for a future primary school and retirement living have been deleted as required by Condition B1 Part B – Modifications in Schedule 2 to the current version of the Concept Plan approval. Condition B1 Part B can be deleted (see Part B below). The southern access road from the Princes Highway to the Lakeside Precinct has been deleted in accordance with Condition B2 Part B – Modifications in Schedule 2 to the current version of the Concept Plan Approval. Condition B2 Part B – Modifications in Schedule 2 to

<table>
<tr><td></td><td></td><td>the current version of the Concept Plan can now be deleted (see Part B below).</td></tr>
<tr><td>A2 Development in accordance with Plans and Documentation

The development shall be undertaken generally in accordance with:

▪ The Environmental Assessment dated February 2011 prepared by DFR Planning Consultants, except where amended by the Preferred Project Report dated June 2012 prepared by DFP Planning Consultants including the supplementary Flood Risk Assessment Report prepared by Bewsher (ref. J1898L_2), dated 10 January 2013;
▪ The Statement of Commitments prepared by DFP Planning Consultants; and
▪ The following drawings

<table><tr><th>Author/Drawing No./Report</th><th>Name of Plan</th><th>Date</th></tr><tr><td>Warren Lee Urban Design</td><td>TRUenergy – Tallawarra Lands Concept Plan</td><td>7 May 2012</td></tr><tr><td>Corkery Consulting, Landscape Plan Report Figure 30 PPR Appendix K</td><td>The Street Hierarchy</td><td></td></tr></table>
except for as modified by the following pursuant to Section 75O(4) of the Act.</td><td>A2 Development in accordance with Plans and Documentation

The development shall be undertaken generally in accordance with:

▪ The Environmental Assessment dated February 2011 prepared by DFR Planning Consultants, except where amended by the Preferred Project Report dated June 2012 prepared by DFP Planning Consultants including the supplementary Flood Risk Assessment Report prepared by Bewsher (ref. J1898L_2), dated 10 January 2013;
▪ The modified Statement of Commitments prepared by Cardno NSW/ACT Pty Ltd dated 11 September 2019; and
▪ The following drawings

<table><tr><th>Author/Drawing No./Report</th><th>Name of Plan</th><th>Date</th></tr><tr><td>Warren Lee Urban Design</td><td>TRUenergy – Tallawarra Lands Concept Plan</td><td>7 May 2012</td></tr><tr><td>~~Corkery Consulting, Landscape Plan Report Figure 30 PPR Appendix K~~</td><td>~~The Street Hierarchy~~</td><td></td></tr><tr><td>Cardno NSW/ACT Figure 7-2</td><td>Final Concept Plan - North</td><td>09/09/2019</td></tr><tr><td>Cardno NSW/ACT Figure 7-3</td><td>Final Concept Plan - Central</td><td>11/09/2019</td></tr><tr><td>Cardno NSW/ACT Figure 7-4</td><td>Proposed Development Controls Plan - North</td><td>12/09/2019</td></tr></table></td><td>Modified to list the additional plans and documents submitted with, and approved by this modification application.</td></tr>
</table>

	<u>Cardno NSW/ACT Figure 7-5</u> | <u>Proposed Development Controls Plan - Central</u> | <u>09/09/2019</u> except for as modified by the following pursuant to Section 75O(4) <u>and Section 75W</u> of the Act.	
A6 First Future Application The first future application must be an application to Council for superlot subdivision of the entire site and is to be generally in accordance with the land use boundaries provided in the Concept Plan. In addition to other requirements of the Terms of Approval, this application must identify the sequential staging of the Concept Plan.	**A6 First Future Application** The first future application shall be an application to Council for superlot subdivision of the entire site and it is to be generally in accordance with <u>the plan titled 'Proposed First Superlot Subdivision Plan' prepared by Bridgehill Group Drawing Reference BH-001 Rev.01 dated 06/09/2019</u> and land use boundaries provided in the Concept Plan.	Modified to account for the additional information and adjustments made with this modification and clarify the condition is relevant to the first future superlot subdivision application as referred to in Condition A6.
PART B – MODIFICATIONS		
B4 Environmental Corridor The proposed woodland vegetation along the ridgeline on the southern edge of the Northshore Precinct (identified in the Landscape Plan, prepared by Corkery Consulting, May 2012) shall comprise a continuous vegetated corridor providing ecological connectivity such that the movement of native fauna species between Mount brown Reserve and the foreshore of Lake Illawarra is facilitated.	**B4 Environmental Corridor** The proposed woodland vegetation along the ridgeline on the southern edge of the North<u>ern</u> ~~shore~~ Precinct (identified in the Landscape Plan, prepared by Cardno NSW/ACT Pty Ltd Plan Reference 82017142) ~~Corkery Consulting, May 2012~~) shall comprise a continuous vegetated corridor providing ecological connectivity such that the movement of native fauna species between Mount brown Reserve and the foreshore of Lake Illawarra is facilitated.	The previously referenced Landscape Plan for the ridgeline park has been superseded by the Landscape Concept Plan prepared by Cardno NSW/ACT. The new Landscape Plan provides a superior outcome in terms of a continuous vegetated corridor and ecological connectivity between the lake foreshore and Mount Brown Reserve as well as creating a visual buffer of canopy trees to effectively treat the visual impact of the Northern Precinct redevelopment as viewed from the lake and lake foreshores.
B5 Bushfire Protection – Perimeter Road The Type 4 roads that form a perimeter road for bushfire planning purposes (as illustrated in fig 30 of the Landscape Plan, prepared by Corkery Consulting, dated May 2012) must be changed to a Type 3 road or increased in the width to meet the perimeter road	**B5 Bushfire Protection – Perimeter Road** The Type 4 roads that form a perimeter road for bushfire planning purposes (as illustrated in fig 30 of the Landscape Plan, prepared by Corkery Consulting, dated May 2012) must be changed to a Type 3 road or increased in the width to meet the perimeter road requirements of Section 4.1.3 of *Planning for Bushfire*	Modification to accommodate for revised Bushfire Assessment relevant to the modifications to the Central and Northern Precincts.

requirements of Section 4.1.3 of *Planning for Bushfire Protection 2006*.	*Protection 2006* except where superseded by the recommendations of the Bushfire Assessment prepared by Peterson Bushfire dated 24 July 2017.	
SCHEDULE 3 **FUTURE ENVIRONMENTAL ASSESSMENT REQUIREMENTS**		
8. Cultural Heritage Management Plan The first future application to Council (refer to Condition A6) shall be accompanied by a Cultural Heritage Management Plan that details how impacts on Aboriginal and non-Aboriginal heritage across the entire site will be minimised and managed. The plan shall include, but not necessarily be limited to: (f) Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items to minimise and avoid impacts on these items; (g) How heritage items (Aboriginal objects and relics or works) discovered during the construction of the project will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the project area; (h) Stop-work and notification procedures to be implemented should any unexpected impact to archaeological deposits and/or State significant relics not previously identified be discovered; (i) A procedure for continued consultation with the relevant Aboriginal stakeholders during site preparation and subdivision works; and (j) Procedures to be followed should non-compliance against any of the provisions of the management plan occur.	**8. Cultural Heritage Management Plan** The first future superlot subdivision application to Council (refer to Condition A6) ~~for~~ shall be accompanied by a Cultural Heritage Management Plan (CHMP) that details how impacts on Aboriginal and non-Aboriginal heritage ~~across the entire site~~ will be minimised and managed. The plan shall be prepared in two parts to match the responsibilities of landowners in preparing for, and implementing, all future development. Part 1 of the plan shall apply to the Central and Northern Superlots and shall be submitted in detail with the first future superlot subdivision application. Part 2 of the Plan shall apply to the Southern (Lakeside) Precinct and shall be submitted with the first development application for the Southern Precinct following the approval of the first future superlot subdivision. The plan shall include, but not necessarily be limited to: (a) Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items to minimise and avoid impacts on these items; (b) How heritage items (Aboriginal objects and relics or works) discovered during the construction of the project will be considered and managed. This shall include a component within the site induction program for construction workers on Aboriginal and non-Aboriginal heritage within the project area; (c) Stop-work and notification procedures to be implemented should any unexpected impact to	A CHMP identifies the site management methods and responsibilities of developers, site managers and all persons involved in construction activities causing site disturbance. The modification is requested to align the responsibilities of future separate landowners and the practical consequences for land management and land development to be undertaken for the separate precincts.

All future applications must demonstrate how they will implement the Cultural Heritage Management Plan.	archaeological deposits and/or State significant relics not previously identified be discovered; (d) A procedure for continued consultation with the relevant Aboriginal stakeholders during site preparation and subdivision works; and (e) Procedures to be followed should non-compliance against any of the provisions of the management plan occur. All future applications must demonstrate how they will implement the Cultural Heritage Management Plan.	
9. Transfer of environmentally sensitive land and open space into public ownership and the Securing of Environmental Offsets Future applications which include lands to be transferred to public ownership on the "Conceptual Tallawarra Land Ownership Plan" (Figure 37 of the Environmental Assessment) must include details on the proposed ownership arrangements for the land nominated for transfer. In the event that a public authority is unwilling to accept transfer of the lands zoned open space, thje proponent shall retain and maintain these lands as publicly accessible privately owned open space. In the event that a public authority is unwilling to accept transfer of the lands zoned for environmental purposes or lands required as an environmental offset, the proponent must implement an alternative method of securing the identified lands in perpetuity, such as establishing a biobanking agreement.	**9. Transfer of environmentally sensitive land and open space into public ownership and the Securing of Environmental Offsets** Future applications which include lands to be transferred to public ownership on the Conceptual Land Ownership Plan to be part of the site-specific DCP ~~on the "Conceptual Tallawarra Land Ownership Plan" (Figure 37 of the Environmental Assessment)~~ must include details on the proposed ownership arrangements for the land nominated for transfer. In the event that a public authority is unwilling to accept transfer of the lands zoned open space, thje proponent shall retain and maintain these lands as publicly accessible privately owned open space. In the event that a public authority is unwilling to accept transfer of the lands zoned for environmental purposes or lands required as an environmental offset, the proponent must implement an alternative method of securing the identified lands in perpetuity, such as establishing a biobanking agreement.	This modification is requested to align the requirements for a Land Ownership Plan to match the timing of a site-specific DCP. The site-specific DCP will be supported by several specialist studies and management plans which will more accurately identify environmentally sensitive land and open space suitable for public ownership. For example: - the CHMP will identify areas of land suited to sensitive management for cultural and heritage reasons - the Flood Risk Assessment Management Plan and the Stormwater Management Masterplan will identify the methods for flood risk management and stormwater management which may require infrastructure and land to be transferred to Council ownership
10. Amended Vegetation Management Plan The first future application to Council (refer to Condition A6) shall be accompanied by an amended Vegetation Management Plan, which includes the following requirements:	**10. Amended Vegetation Management Plan** The first future application to Council (refer to Condition A6) shall be accompanied by an amended Concept Vegetation Management Plan to be prepared in two parts – one for the land north of Yallah Bay Road and	The modification is requested to match the fact that there will be no works with the first future superlot subdivision application (including no vegetation management). The modification is also requested to align the responsibilities of future separate landowners and the practical consequences for vegetation management

(a) Inspection of revegetated and weed managed areas by an appropriately qualified environmental expert at the end of the initial five-year establishment period to ascertain whether the works are self-sustaining. If they are self-sustaining, develop an ongoing management regime for these areas in perpetuity; and/or (b) The provision of a vegetation condition report prepared by an appropriately qualified environmental expert at the end of the initial five-year establishment period. The condition report shall outline additional management measures to be undertaken if after five years it is determined that the revegetated areas are not self-sustaining. The condition report shall also outline recommendations for the management in perpetuity of the areas covered by the VMP.	one for the area south of Yallah Bay Road, with each part including~~, which includes~~ the following requirements: (a) Commitment to inspection of revegetated and weed managed areas by an appropriately qualified environmental expert at the end of the initial five-year establishment period to ascertain whether the works are self-sustaining. If they are self-sustaining, develop an ongoing management regime for these areas in perpetuity; and/or (b) Commitment to the provision of a vegetation condition report prepared by an appropriately qualified environmental expert at the end of the initial five-year establishment period. The condition report shall outline additional management measures to be undertaken if after five years it is determined that the revegetated areas are not self-sustaining. The condition report shall also outline recommendations for the management in perpetuity of the areas covered by the VMP	and land development to be undertaken for the separate precincts.
11 Further Investigation of the Areas of Environmental Concern and engagement of a Site Auditor accredited under the Contaminated Land Management Act 1997 Future applications that include those lands nominated as Areas of Environmental Concern (AECs) in the Coffey Environments Report (December 2010) must be accompanied by a further environmental assessment report In addition to adopting the recommendations contained in Section 12 of the Coffey Environments Groundwater Modelling Assessment report, the further investigations must consider: ▪ the potential for contaminants present in the soil and ground in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, Duck Creek and ultimately to the receiving waters of Lake Illawarra, and measures to address	**11 Further Investigation of the Areas of Environmental Concern and engagement of a Site Auditor accredited under the Contaminated Land Management Act 1997** ~~Future applications that include those lands nominated as Areas of Environmental Concern (AECs) in the Coffey Environments Report (December 2010)~~ The following development applications must be accompanied by a further environmental assessment report (i) The first future superlot subdivision application to Council (refer to Condition A6) must include a further environmental assessment report in relation to the northern and central super lots; and (ii) Any application for the further subdivision of the superlot containing the Southern Precinct (as identified in Condition A6) must include a further environmental assessment report in relation to the whole of the Southern Precinct.	See Issue 1 to the Key Issues letter for a detailed justification of the modification of Condition 11. The modifications do not change: ▪ the requirement to consider the findings of contamination investigations acknowledged in the current Concept Approval; or ▪ the site-specific matters requiring further investigation as identified to date by the Concept Approval. Therefore the modifications do not change the requirements to address specific asbestos-related investigations as required by the EPA. The modifications do change the condition to allow: ▪ Investigation and reporting to be spatially separated so that separate landowners can fulfill the requirements of SEPP 55 with future DAs;

this including the feasibility of remediation of contaminated soils and/or the containment of the sources of contamination; ▪ measure to ensure that the environment attributes of conservation lands on the site are not adversely impacted on by contaminants present in the soil and groundwater; ▪ recommendations for the ongoing management of contaminated groundwater; ▪ the potential for the contamination present in soil and groundwater in the vicinity of the ash ponds to adversely affect groundwater dependent ecosystems on the site; and ▪ any risks to human health or the environment. Following the completion of the further investigations, the proponent must engage a Site Auditor accredited under the *Contaminated Land Management Act 1997* to verify the adequacy of the investigations (and any proposed remediation) certify that the site is suitable for the proposed use.	<u>The further environmental assessment report must address all relevant Areas of Environmental Concern in the Coffey Environment Report (December 2010).</u> In addition to adopting the recommendations contained in Section 12 of the Coffey Environments Groundwater Modelling Assessment report, the further investigations must consider<u>, where relevant:</u> ▪ the potential for contaminants present in the soil and ground in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, Duck Creek and ultimately to the receiving waters of Lake Illawarra, and measures to address this including the feasibility of remediation of contaminated soils and/or the containment of the sources of contamination; ▪ measure to ensure that the environment attributes of conservation lands on the site are not adversely impacted on by contaminants present in the soil and groundwater; ▪ recommendations for the ongoing management of contaminated groundwater; ▪ the potential for the contamination present in soil and groundwater in the vicinity of the ash ponds to adversely affect groundwater dependent ecosystems on the site; and ▪ any risks to human health or the environment. Following the completion of the further investigations, the proponent must engage a Site Auditor accredited under the Contaminated Land Management Act 1997 to verify the adequacy of the investigations (and any proposed remediation). <u>Prior to the issue of any Subdivision Certificate (other than for the first superlot subdivision) the proponent must obtain a Site Audit Statement to</u> certify that the ~~site~~ <u>land the subject of the Subdivision Certificate</u> is suitable for the proposed use. <u>No building may be erected on the land prior to the issue of a Site Audit Statement certifying that the land is suitable for the proposed building and associated use.</u>	▪ Appropriate levels of investigation and reporting to be completed for the Central and Northern superlot by Bridgehill at the time of the first superlot subdivision consistent with SEPP 55 and EPA requirements; and Appropriate levels of investigation and reporting with any future DA on any part of the site consistent with the requirements of SEPP 55 and EPA requirements

12 Engagement of a site auditor to verify the adequacy of asbestos soil sampling and asbestos contamination investigations The first future application to Council (refer to Condition A6) must include, a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by the Douglas Partners (July 2010) and certification the site for the proposed use.	**12 Engagement of a site auditor to verify the adequacy of asbestos soil sampling and asbestos contamination investigations** The first future superlot subdivision application to Council (refer to Condition A6) must include, in relation to the northern and central super lots, a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by the Douglas Partners (July 2010) and any further investigations subsequently undertaken by the proponent and certification ~~of the suitability of~~ that the ~~site~~ northern and central super lots can be made suitable for their proposed use. Any application to further subdivide or carry out any works on the Southern Precinct (as defined on the Super Lot Subdivision Plan and Condition A6) must include a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by the Douglas Partners (July 2010) and any further investigations subsequently undertaken by the proponent and certification that the Southern Precinct can be made suitable for its proposed use.	See Issue 1 to the Key Issues letter for a detailed justification of the modification of Condition 12. The modifications do not change: ▪ the requirement to consider the findings of contamination investigations acknowledged in the current Concept Approval; or ▪ the site-specific matters requiring further investigation as identified to date by the Concept Approval. Therefore the modifications do not change the requirements to address specific asbestos-related investigations as required by the EPA. The modifications do change the condition to allow: ▪ Investigation and reporting to be spatially separated so that separate landowners can fulfill the requirements of SEPP 55 with future DAs; ▪ Appropriate levels of investigation and reporting to be completed for the Central and Northern superlot by Bridgehill at the time of the first superlot subdivision consistent with SEPP 55 and EPA requirements; and Appropriate levels of investigation and reporting with any future DA on any part of the site consistent with the requirements of SEPP 55 and EPA requirements
25 Satisfactory Arrangements for the provision of Designated State public infrastructure The first development application to Council (refer to Condition A6) must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009.	**25 Satisfactory Arrangements for the provision of Designated State public infrastructure** The first development application ~~to Council (refer to Condition A6)~~ for urban development of the Northern and Central precincts must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure for subdivision of land within the northern and central precincts in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009. The first development application for urban development of the Southern Precinct (as shown in the approved	This modification is requested to match the fact that there will be no works and no additional dwelling entitlements created with the first future superlot subdivision application. No SIC arrangements will be necessary prior to the approval of the development application for first superlot subdivision.

	‘Proposed First Superlot Subdivision Plan’ prepared by Bridgehill Group Drawing Reference BH-001 Rev.01 dated 06/09/2019) must demonstrate that satisfactory arrangements have been made for the provision of designated State public infrastructure for the subdivision of land in the Southern (Lakeside) Precinct in accordance with Clause 6.1 of Wollongong Local Environmental Plan 2009.	

APPENDIX

C

PROPOSED MODIFIED STATEMENT OF COMMITMENTS

APPENDIX C - Schedule of modified Statement of Commitments for the Concept Approval

The following table is a list of the Statement of Commitments to the Concept Approval that are requested to be modified.

Only those Statements requested to be modified are listed in the table.

Modifications are presented in 'track 'changes' format with strikethrough text to be deleted and underlined text to be added.

Table 9-1 Statement of Commitments Tallawarra Lands Concept PlanMP09_0131

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
1	Local Infrastructure	~~TRUenergy~~ The landowners commit~~s~~ to consulting with Wollongong City Council to put in place satisfactory arrangements for the provision of local infrastructure.	~~Arrangements~~ A Letter of offer to be submitted as part of a future development application which seeks consent to subdivide the Tallawarra Lands site into a series of superlots generally consistent with the plan titled 'Proposed First Superlot Subdivision Plan' prepared by Bridgehill Group Drawing Reference BH-002 Rev.01 dated 06/09/2019 ~~**Figure 10** of the EA~~. ~~The timeframe for delivery of the works will be detailed in the agreement when it is prepared~~.	Relevant Consent Authority	Modification to match anticipated landowner arrangements and new superlot subdivision plan consistent with the modified Concept Plan.
1	Roads / Bridge in E2 Zone	~~TRUenergy~~ The landowners commit~~s~~ to offering to enter into an agreement with Wollongong City Council whereby approval under Part 5 of the EP&A Act would be sought for the proposed roads and bridge in the E2 zone in accordance with Clause 94(1) of SEPP Infrastructure 2007. This process would put in place arrangements for the provision of the proposed roads and bridge in the E2 zone by or on behalf of Council. This includes the bridge across Duck Creek and the length of road either side of the bridge ~~as well as the road~~	Arrangements to be submitted as part of a future development application(s) relating to carry out road works for those parts of the site.	Relevant Consent Authority	Modification to be consistent with Condition B2 Part B – Modifications to the Concept Approval.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		~~that leads into the B6 Enterprise Corridor zoned land from the Princes Highway.~~			
2	State/ Regional Infrastructure	The landowners commit~~s~~ to consulting with the State Government to put in place satisfactory arrangements for the provision of State/Regional infrastructure.	Arrangements to be submitted as part of ~~a~~ future development application~~s~~ which seeks consent to further subdivide the Tallawarra Lands Precincts and after the first future superlot subdivision ~~site into a series of superlots generally consistent with **Figure 10** of the EA.~~ The timeframe for delivery of the works will be detailed in the agreement when it is prepared.	Department of Planning & Infrastructure	Modification to be consistent with Conditions A6 and 25 to the Concept Approval
3	Superlot subdivision	The landowners commit~~s~~ to lodging a development application with Wollongong City Council to carry out a superlot subdivision generally in the manner illustrated in the indicative superlot plan titled 'Proposed First Superlot Subdivision Plan' prepared by Bridgehill Group Drawing Reference BH-002 Rev.01 dated 06/09/2019 The landowners commit~~s~~ to preparing more detailed subdivision plans ~~and notes that further environmental assessment will not be required, having been adequately addressed through the Concept Plan application~~.	The timing of lodgement of a super lot DA is not contingent upon the timing of the Concept Plan application.	Relevant Consent Authority	Modification to match Condition A6 to the Concept Approval. Modification to reflect the conceptual lot layout will be subject to further detailed documentation to be submitted with future development applications.
4	Landscape Design	Future Development Applications will reference the Landscape Plan and adopt the Landscape Principles prepared by Corkery Consulting and the Landscape Concept Plan prepared by Cardno NSW/ACT Pty Ltd for the ridgeline park in the Northern Precinct to guide the design and treatment of the following: ▪ the residential precincts areas, employment lands, and neighbourhood centre components of the Concept Plan, including the principles of	Landscape plans to be further refined during the preparation of subsequent applications for the development of the super lots (or part of the super lots)	Relevant consent authority	Modification to match the additional Landscape Concept Plan for the ridgeline park in the Northern Precinct.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		visual amenity, function, ESD principles and biodiversity. ▪ the open space zones (e.g. boundary zones, riparian zones, drainage lines and stormwater quality ponds, recreational areas) of each Precinct, including the recommended planting schedule. ▪ the street network. ▪ cycling infrastructure.			
5a	Geotechnical	The landowners commits to undertaking further geotechnical engineering assessment of those parts of the Concept Plan development footprint identified as being constrained in the Geotechnical, Contamination and Groundwater Investigation dated 30 July 2010, prepared by Coffey Environments.	To be undertaken on a stage by stage basis as part of future development applications on affected land for residential subdivision, road works or construction of buildings.	Relevant consent authority	No change.
5b	Groundwater	The landowners commits to implementing the recommendations in Section 12 of the Groundwater Modelling Assessment Report dated 3 April 2012 prepared by Coffey Environments.	Recommendations to be implemented as per the timing set out in each recommendation and on a stage by stage basis.	Relevant consent authority and NSW Office of Water	Modification to match landowners' responsibilities post-superlot subdivision.
6	Land contamination	The landowners commits to continuing investigations into the areas of environmental concern (AECs) identified in the Geotechnical, Contamination and Groundwater Investigation dated 30 July 2010, prepared by Coffey Environments. The AECs to be further investigated are those parts of the site that fall within proposed development areas.	Further investigation to be undertaken on a stage by stage basis as part of future development applications on affected land.	Relevant consent authority	Modification to match landowners' responsibilities post-superlot subdivision.
6a		The landowners commits to managing land contamination in accordance with State Environmental Planning Policy No. 55 – Remediation of Land and the Managing Land Contamination: Planning Guidelines.	Further investigation to be undertaken on a stage by stage basis as part of future development applications on affected land.	Relevant consent authority	Modification to match landowners' responsibilities post-superlot subdivision.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
7		The landowners commits to undertaking any requirements for remediation and management as part of the findings from the further investigations of the AECs.	Recommended remediation works to be carried out on a stage by stage basis at the time of (or just prior to) any earthworks for subdivision works in the AECs.	Relevant consent authority	Modification to match landowners' responsibilities post-superlot subdivision.
8		The landowners commits to implementing the recommendations detailed in the Preliminary Hydrogeological Assessment – Ash Ponds dated 23 November 2010, prepared by Coffey Environments.	To be undertaken on a stage by stage basis as part of future development applications on affected land.	Relevant consent authority	Modification to match landowners' responsibilities post-superlot subdivision.
9		The recommendations detailed in the Register of Hazardous Materials Report in Residences in Northern Precinct dated 15 March 2010 prepared by Coffey Environments will be implemented.	To be undertaken in on a stage by stage basis accordance with the timing specified in the Register of Hazardous Materials Report in Residences in Northern Precinct	Relevant consent authority	No change.
10	Urban design strategies	The urban design strategies recommended in the Richard Lamb and Associates Visual, Landscape and Scenic Resource Management Considerations will be reviewed and adopted for future development in the following areas of the Concept Plan site as identified in the Report: ▪ the large lot and central residential precinct in Visual Exposure Zone A and north shore residential precinct in Visual Exposure Zone B ▪ the lakeside residential precinct in Visual Exposure Zone D the employment in Visual Exposure Zones A and D	To be considered on a stage by stage basis during the preparation of future development applications for the identified zones only.	Relevant consent authority	No change.
11	Traffic Management	The landowners commits to consulting with Wollongong City Council to put in place satisfactory arrangements to deliver the following road improvements:	Road improvements will be undertaken on a stage by stage basis. The timeframe for delivery of the road improvements will be	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		▪ the conversion of the intersection of Cormack Ave and the Princes Highway into a two lane circulating roundabout; ▪ two lane circulating roundabouts at each of the two access points to the site from the Princes Highway; ▪ the provision of a roundabout at the site access point off Cormack Avenue; ▪ Upgrade Yallah Bay Road to a collector road; ▪ Construction of the north-south collector road; and ▪ Consequential works to facilitate the site access points.	detailed in discussion regarding the satisfactory arrangements.		
12	Ecologically Sustainable Development	Precinct scale and other major development applications consistent with the Concept Plan will demonstrate how they address the relevant desired sustainability outcomes contained in the Sustainability Report prepared by Urbis and dated 18 October 2010.	Details of the response to be submitted on a stage by stage basis with the relevant development application(s).	Relevant consent authority	No change
13	BASIX	Future residential development will achieve potable water and greenhouse gas reductions equivalent to BASIX +10% (2010 = 50% reduction).	Compliance to be demonstrated on a stage by stage basis in the development application submissions.	Relevant Consent Authority	No change
14	Sustainability for commercial and retail	Future commercial and retail development will aspire to a target of a 40% reduction in: ▪ operational greenhouse gas emissions associated with energy use; and ▪ operational potable water use in comparison to similar types of development in NSW.	Compliance to be demonstrated on a stage by stage basis in future development application submissions.	Relevant Consent Authority	No change
15	Utilities infrastructure	The landowners commits to implementing the utilities servicing strategies identified in the Report on Siteworks and Utilities Infrastructure, prepared by Northrop.	Further investigations to be undertaken on a stage by stage basis with development applications.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
16	Aboriginal heritage	The landowners commits to implementing the recommendations of the Aboriginal Archaeological Assessment.	To be implemented on a stage by stage basis with the relevant development application.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
17	European Heritage	The landowners commits to implementing the management recommendations in Section 7.2 of the *Statement of Heritage Impact: Tallawarra Lands Part 3A*, prepared by Biosis Research, dated September 2010. The landowners commits to obtaining assessments of significance / assessments of archaeological potential in relation to sites TH2, TH3, TH4, TH5, TH9 and TH10. The landowners commits to ensuring that if substantial intact archaeological deposits and/or State significant relics not previously identified are discovered, work will cease in the affected area(s), the Heritage Council will be notified and the required assessment / approval will be sought prior to works continuing in the affected area(s).	To be implemented on a stage by stage basis with the relevant development application.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
17a	Heritage	The landowners commits to preparing a Heritage Management Plan detailing how construction impacts on Aboriginal and non-Aboriginal heritage will be minimised and managed. The Plan shall include, but not necessarily be limited to: (i) Specific measures to be applied to works undertaken in close proximity to identified Aboriginal and non-Aboriginal heritage items and "Defined Areas of Aboriginal Sensitivity" to minimise and avoid impacts on these items; (ii) How heritage items (Aboriginal objects and relics or works) discovered during the construction will be considered and managed. This shall include a component within the site induction program for construction workers on	Details to be provided on a stage by stage basis and submitted with the relevant construction involving site excavation works	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		Aboriginal and non- Aboriginal heritage within the site area; Stop-work and notification procedures to be implemented compliant with Heritage Office and OEH guidelines should any unexpected intact archaeological deposits and/or State significant relics not previously identified be discovered; and (iv) The procedure for continued consultation with the relevant Aboriginal stakeholders.			
18	Ecology	The landowners commits to implementing the mitigation measures detailed in Table 12 of the Ecological Assessment report dated 4 March 2011 (Appendix 9 of the EA).	Mitigation measures to be implement on a stage by stage basis in accordance with the timing requirements contained in Table 12. The mitigation measures detailed in Table 12 should be included in any conditions of consent issued in relation to future development applications.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
18a	In perpetuity security of biodiversity outcomes	The landowners commits to entering into discussions with relevant authorities, or recognised private conservation land managers such as Bush Heritage Australia, to arrange for transfer of ownership of the areas of retained vegetation; and/or; dedicating the conservation lands to Wollongong City Council as reserves to be administered under the *Local Government Act*; and/or; establishing an in-perpetuity Property Vegetation Plan under the *Native Vegetation Act 2003*; and/or applying for Conservation Agreement under the *National Parks and Wildlife Act 1974;* and/or establishing a conservation covenant under	To be undertaken on a stage by stage basis prior to completion of relevant works under the Vegetation Management Plan referred to in Commitment No. 19	Relevant authority or recognised conservation land manager Wollongong City Council Catchment Management Authority NPWS/DECCW Nature Conservation Trust of NSW.	Modification to match landowners' responsibilities post-superlot subdivision.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		Nature Conservation Trust Act; and/or securing in perpetuity the biodiversity outcomes of the retained vegetation of the E2 lands through other appropriate legal mechanism(s).		Relevant consent authority	
18b		The landowners commits to holding discussions with the relevant authorities (such as Lake Illawarra Authority and Wollongong City Council) about entering into possible Voluntary Planning Agreements (VPAs) involving future land ownership transfers, infrastructure provision, site remediation and implementation of the Vegetation Management Plan. Any VPAs entered into will specify the works to be undertaken, the party responsible for carrying out the works and the timeframe within which the works will be undertaken.	Prior to determination of the superlot subdivision DA.	Relevant consent authority	Modification to match landowners' responsibilities post-superlot subdivision.
19	Ecology	The landowners commits to implementing the Vegetation Management Plan prepared by Eco Logical dated 4 February 2011, unless other arrangements are made arising out of VPA discussions referred to in Commitment 18b.	Implementation of the Vegetation Management Plan to occur on a stage by stage basis and should be required as a condition of consent on future DAs.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
20		The landowners commits to implementing the Environmental Management Strategy prepared by Eco Logical dated 4 February 2011.	Implementation of the Environmental Management Strategy to occur on a stage by stage basis and should be required as a condition of consent on future DAs.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
21		The landowners commits to the recommendations detailed at Section 5.1 of the GDE Risk Assessment prepared by Eco Logical Australia dated 19 April 2012.	Compliance with the recommendations of the GDE Risk Assessment to occur on a stage by stage basis and may be regulated via the conditions of consent on future DAs.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
22	Bushfire	The landowners commits to implementing the recommendations and management measures contained in the Bushfire Planning Assessment prepared by Eco Logical Australia dated 4 February 2011,	The recommendations are to be implemented on a stage by stage basis as required as part of the assessment of future DAs.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
23	Climate Change	The landowners commits to implementing the 'adaptation considerations' contained in the Climate Change Assessment report prepared by BMT WBM.	To be implemented on a stage by stage basis at the appropriate time of the design development as per the Climate Change Assessment report.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
24	Access	The landowners commits to working with the Lake Illawarra Foreshore Authority to facilitate public access to the foreshore.	Timing will be determined as part of the VPA discussions referred to in Commitment 18b, if such discussions reach an agreement.	Lake Illawarra Authority and Wollongong City Council.	Modification to match landowners' responsibilities post-superlot subdivision.
25	Demolition	The landowners commits to undertaking demolition activities in accordance with AS 2601-2001*: The Demolition of Structures*.	At the time of demolition and on a stage by stage basis.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
26		The landowners commits to employing licensed contractors to remove all contaminated material and to requiring them to comply with the provisions of the *Occupational Health & Safety Regulation 2001*.	Prior to commencement of works associated with removal of contaminated material and on a stage by stage basis.	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
27		The landowners commits to ensuring that demolition activities will only be carried out between 7am and 5pm Monday to Saturday and that no demolition activities will be carried out at any time on a Sunday or a public holiday.	On going during construction	Relevant Consent Authority	Modification to match landowners' responsibilities post-superlot subdivision.
28	Flood Risk Management	Future DAs will adopt the following flood risk management principles. It is noted that these principles exceed, or are equal to, those currently applied by Wollongong City Council in respect of the West Dapto Release Area:	Design to be incorporated into future development applications and on a stage by stage basis.	Relevant development application consent authority	No change

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		▪ All access roads to development precincts to be at or above 100 year flood level after allowing for year 2100 climate change impacts. ▪ Filling for development areas to be at a minimum level of the 100 year flood level allowing for year 2100 climate change impacts. Development floors levels for each land use to be at the flood planning levels set by Wollongong City Council's DCP (Chapter E13).			
29	Flood Management Risk	Future DAs will adopt the following flood risk management principles: (a) All future development decisions will be based on the most up-to-date flood model available at the time of the future DA and include all components of the project which may influence flood behaviour (e.g. changes to riparian vegetation, filling adjacent to the floodplain, new bridges, etc.). It is recognised that flood models need revision over time as new data becomes available or Government policies alter. This includes the imminent revisions to the rainfall intensity-frequency-duration data published by the Bureau of Meteorology, and changes in Government policy and/or accepted practice concerning the impacts of climate change on sea levels and rainfall intensities. Further, flood levels within development areas remote from the main waterways will be modelled having regard to the capacity of the drainage system of the development area and its overland flow routes. (b) Land to be filled will be at sufficient height and grade to allow free-drainage of the filled area into the surrounding waterway.	Design to be incorporated into relevant future development applications and on a stage by stage basis.	Relevant development application consent authority	No change

No	Subject	Commitment	Timing	Responsible Monitoring Body/ Authority	Justification for modification
		(c) When stormwater concept designs are developed for proposed fill areas, potential flood hazard areas will be analysed and managed in accordance with best practice and the requirements of the Floodplain Development Manual and Council's DCP (Chapters E13 and E14). No filling of floodplain land will occur which produces off-site impacts in accordance with the "flood affectation" requirements of Chapter E13 of Council's DCP. (e) All future housing will be serviced by at least one road route providing egress off-site and at a height for the entire route which is no lower than the 100 year ARI flood level after allowing for year 2100 climate change impacts. Where future housing areas are isolated in a PMF, facilities (e.g. high ground or elevated building floors) will be provided for safe refuge above the PMF level, within the isolated area. (f) The existing old railway bridge across Duck Creek provides significant constriction to flood flows, raising flood levels upstream in major flood events. The Proponent commits to the following measures to mitigate flooding impacts: ▪ designing the new bridge to provide less constriction to achieve lower upstream flood levels for the 100 year ARI and larger events; and ▪ setting the levels of new roads, landfill and habitable floors levels of proposed buildings based on flood modelling consistent with Council's Blockage Policy.			

APPENDIX

D.1

FULL PAGE PUBLIC NOTICE OF NOTIFICATION AND REGISTRATION OF ABORIGINAL INTEREST

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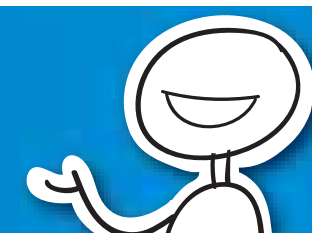

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WOLLONGONG CITY COUNCIL

PUBLIC NOTICE

Exhibition of Draft Wollongong City-Wide Development Contributions Plan 2019

The Draft 2019 Plan is the yearly review of the current adopted Wollongong City-Wide Development Contributions Plan 2019. The review includes updating infrastructure items, clarified clauses, changes to exemptions and updated maps.

The Draft Plan is on exhibition from **Saturday 24 August 2019 to Friday 27 September 2019** and can be viewed at:

- Council libraries during business hours
- Council's Administration Building between 9am and 5pm weekdays
- Council's website – Have your say page **wollongong.nsw.gov.au**

To make a submission write or email Council at **council@wollongong.nsw.gov.au** before the submission period closes on **Friday 27 September 2019**. Please quote reference: CST-100.05.062.

For more information call Land Use Planning on 4227 7111.

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Ref: 61811E

Closing date/time: 10am AEST Tuesday, 3 September 2019

Enquiries: Lisa Friebel, Project Officer on 02 4429 3344

Documents can be downloaded free of charge at **www.tenderlink.com/shoalhaven**

Notification and Registration of Aboriginal Interest

Cardno, on behalf of Bridgehill Group intends to develop new residential communities, a light industrial development and tourism facilities at the Northern and Central Precincts at Tallawarra, Yallah, NSW. The original concept approval (MP09_0131) was granted on 23 May 2013 by the Planning Assessment Commission (PAC) as a delegate for the Minister for Planning and Infrastructure for a mixed use development. Bridgehill Group, intends to modify the existing concept approval MP 09_0131 MOD 1 under Part 3A section 75W of the Environmental Planning and Assessment Act 1979 (EP&A Act). If concept approval is granted, the proposed development will be assessed as integrated development under Part 4 of the EP&A Act. For more information please contact: Bridgehill Group C/-Adam Clarke, Cardno, PO Box 1285, Wollongong NSW 2500 or phone: (02) 4231 9600

Biosis on behalf of Cardno are restarting consultation with the Aboriginal community and are seeking to identify Aboriginal people who hold cultural knowledge in determining the significance of Aboriginal object(s) and/or places in the vicinity of the above area to register their interest in a process of community consultation.

The purpose of Aboriginal community consultation is to assist the PAC in assessing the 75W modification application; and the Director General of DPIE in their consideration and determination of any subsequent Aboriginal Heritage Impact Permits for the proposed development if required. The project will be undertaken in accordance with the National Parks and Wildlife Act 1974.

To register an interest in this project please contact Samantha Keats, Biosis Pty Ltd 30 Wentworth Street Port Kembla, NSW 2502, email: skeats@biosis.com.au

Please note that the name of each group that registers for consultation on this project will be provided to DPIE and the Local Aboriginal Land Council unless the group specifies that they do not want their details released.

REGISTRATIONS MUST BE RECEIVED BEFORE 5PM ON 7 SEPTEMBER 2019

Tenders

LATEST E-TENDERS

wollongong city of innovation

E5388 – Guest Park Amenities Refurbishment
– Contact: Rhonda Jorgensen on 02 4227 8885
– Closing: 10/09/2019 10am NSW

Contractors wishing to respond to this tender will find the full details including contacts at the URL below.

www.tenderlink.com/wollongong

LATEST E-TENDERS

wollongong city of innovation

T17/56 – Waste-Wise Event Full Waste Management Services
– Contact: Rhonda Jorgensen on 02 4227 8885
– Closing: 17/09/2019 10am NSW

Contractors wishing to respond to this tender will find the full details including contacts at the URL below.

www.tenderlink.com/wollongong

LATEST E-TENDERS

wollongong city of innovation

T19/14 – Expression of Interest – Cash In Transit
– Contact: Nathan Warren on 02 4227 8885
– Closing: 17/09/2019 10am NSW

Contractors wishing to respond to this tender will find the full details including contacts at the URL below.

www.tenderlink.com/wollongong

LATEST E-TENDERS

wollongong city of innovation

T19/28 – Harry Graham Park and Figtree Oval No. 2 Sportfield Lighting
– Contact: Rhonda Jorgensen on 02 4227 8885
– Closing: 17/09/2019 10am NSW

Contractors wishing to respond to this tender will find the full details including contacts at the URL below.

www.tenderlink.com/wollongong

MERCURY

FRONT COUNTER HOURS
As of 2 September 2019
Monday - Friday: 9.00am - 1.00pm
13 24 25 OR **4221 2261**
77 Market St, Wollongong
AW3798703

Positions Vacant

NextPath

Based in Camden and Narellan, NextPath is a program of Mater Dei, a contemporary and innovative organisation making a difference in the lives of children and young people with a disability.

We are seeking experienced, committed professionals to work in our Post School and Assessment and Therapy Programs.

Assessment and Therapy Program requires:
- **Assessment and Therapy Manager**
- **Speech Pathologist**

NextPath Post School Program requires:
- **Curriculum Lead**
- **Goal Facilitator**

Details of these positions can be found on our website:
https:/www.nextpath.org.au/about-us/careers

Positions Vacant

Shellharbour Anglican College
Established in 2004

PDHPE
Temporary, Long Service Position
1.0 fte commencing Term 4, 2019

ENGLISH
Permanent 1.0 fte commencing Term 1, 2020

HSIE
Permanent 0.8 fte commencing Term 1, 2020

ADMINISTRATIVE ASSISTANT /STUDENT RECEPTION
Permanent 1.0 fte commencing Term 1, 2020

LIBRARY CLERICAL ASSISTANT
Permanent Part time/Term time commencing Term 1, 2020

Closing date: Monday 2 September 2019
For further information please visit our website.

www.shellharbourac.nsw.edu.au

APPENDIX D.2

DUE DILIGENCE FOR ABORIGINAL ARCHAEOLOGY – NORTHERN PRECINCT ADDITIONAL URBAN FOOTPRINT

Tallawarra Lands North Precinct: Aboriginal Cultural Heritage Assessment

DRAFT REPORT

Prepared for Cardno

21 October 2019

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Report to:	Cardno
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Document control

Version	Internal reviewer	Date issued
Draft version 01	Amanda Markham	21/10/2019
Final version 01	TBA	TBA

Acknowledgements

Biosis gratefully acknowledges the contributions of the following people and organisations in preparing this report:

Registered Aboriginal Parties

- Illawarra Local Aboriginal Land Council (ILALC)
- Warra Bingi Nunda Gurri
- Woronora Plateau Gundangara Elders Council
- Guunamaa Dreaming and Sites Surveying
- James Davis
- Duncan Falk Consultancy
- Gumaraa
- Yerramurra (Murrin Clan/Peoples)
- Barraby Cultural Services
- Yurrandaali Cultural Services
- Yulay Cultural Services
- Paul James McLeod
- Murra Bidgee Mullangari Aboriginal Corporation
- Muragadi
- Leanne Tungai
- South Coast Peoples
- Tungai Tonghi
- Shaun Carroll

Government Departments

- Environment, Energy and Science group (EES, formerly OEH)
- National Native Title Tribunal (NNTT)
- Wollongong City Council (WCC)
- South East Local Land Services (LLS)
- Office of the Registrar Aboriginal Land Rights Act

Client

- Cardno on behalf of Bridgehill Group

Biosis

- Sonika Kumar, Lauren Harley and Lucy Wilson for mapping

Contents

Tables

Figures

Glossary

ACHA	Aboriginal cultural heritage assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AR	Archaeological Report
CBD	Central Business District
Consultation requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
DA	Determining Authority
DECCW	Department of Environment, Climate Change and Water
DP	Deposited Plan
EES	Environment, Energy and Science Group (formerly OEH)
EP&A Act	*Environmental Planning and Assessment Act 1979*
ICOMOS	International Council on Monuments and Sites
ILALC	Illawarra Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
NPW Act	National Parks and Wildlife Act
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NTSCORP	Native Title Services Corporation
NNTT	National Native Title Tribunal
OEH	NSW Office of Environment and Heritage (now EES)
RAP	Registered Aboriginal Party
the Code	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd was commissioned by Cardno on behalf of Bridgehill Group to undertake an Aboriginal cultural heritage assessment (ACHA) of a proposed development at Tallawarra (Northern Precinct), Yallah New South Wales (NSW). Bridgehill Group have acquired some of the Tallawarra Lands in the Northern and Central Precincts from Energy Australia, and intend to develop new residential communities on those lands.

Cardno on behalf of Bridgehill Group intends to lodge a development application for the proposed electrical transmission relocation in the Northern Precinct and to modify the existing concept approval for the Northern and Central Precincts (MP 09_0131 MOD 1). Wollongong City Council is the Determining Authority (DA) and will assess the application to help them determine if the proposed development is likely to have a significant effect on the environment, including Aboriginal cultural heritage. The boundary of the study area has been modified since the previous assessment undertaken by Biosis (2017) to include this electrical easement. An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) (the Code) has been undertaken for this additional area and is included in Appendix 7.

This ACHA covers the Northern Precinct (the study area) and aims to determine whether the proposed modification will have any additional impacts on Aboriginal cultural values. The study area is located within the Tallawarra North Precinct, Yallah NSW. It encompasses Lot 30 DP 1175058 and part Lot 31 DP 1175058, and is approximately 12 kilometres south west of Wollongong Central Business District (CBD). It encompasses 45.06 hectares of private land and the adjacent road reserves.

This report has responded to Section 6.10.1 Aboriginal Cultural Heritage of the *Tallawarra Lands, Yallah: Request for Secretary's Environmental Assessment Requirements* (Urbis 2016) to:

- Confirm the location of archaeological sites relative to the proposed expanded areas.
- Consultation with relevant stakeholders prior to preparation of the EIS.
- Identify the nature and extent of impacts on Aboriginal and cultural heritage values across the project area; and
- Provide the actions that will be taken to avoid or mitigate impacts of the project or Aboriginal cultural heritage values.

SEARs Item	Response
12. Aboriginal Cultural Heritage **Aboriginal Cultural Heritage Assessment in accordance with *the Guide to investigating Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011) and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW)**	This report has been conducted in accordance with the *Guide to Investigating Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). This report supports the Aboriginal cultural heritage assessment, which has been conducted in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a). Consultation with Registered Aboriginal Parties is currently underway.

There are 107 Aboriginal cultural heritage sites registered with the Aboriginal Heritage Information Management System (AHIMS) register in a three square kilometre area around the study area. An archaeological survey was conducted on 29 June 2017. The overall effectiveness of the survey for examining the ground for Aboriginal sites was deemed low. This was attributed to vegetation cover restricting ground surface visibility combined with a low amount of exposures. No previously unrecorded Aboriginal cultural heritage sites were identified during the field survey. One area of moderate archaeological potential, previously identified by the 2010 Biosis assessment, was redefined.

Within the study area, there are two recorded Aboriginal sites that may be subject to harm (AHIMS 52-5-0223 and 52-5-0225). It is expected that the potential of harm to 52-5-0223, and 52-5-0225 from the proposed development will be direct, with a total loss of value. Two AHIMS sites (52-5-0642, and 52-5-0643) are located within 10 metres of the study area, and may be subject to harm. It is expected that the potential of harm to 52-5-0642, and 52-5-0643 from the proposed development will be indirect, with a partial loss of value.

Consultation

The Aboriginal community was consulted regarding the heritage management of the project throughout its lifespan. Consultation has been undertaken as per the process outlined in the DECCW document, *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b) (consultation requirements). Community consultation has been restarted due the lapse in consultation of more than six months. This ACHA includes the current community consultation and the previous consultation documentation is included in Appendix 6.

The appropriate government bodies were notified and advertisements placed in the *Illawarra Mercury* newspaper (24 August 2019), which resulted in the following Aboriginal organisations registering their interest:

- Illawarra Local Aboriginal Land Council (ILALC)
- Warra Bingi Nunda Gurri
- Woronora Plateau Gundangara Elders Council
- Guunamaa Dreaming and Sites Surveying
- James Davis
- Duncan Falk Consultancy
- Gumaraa
- Yerramurra (Murrin Clan/Peoples)
- Barraby Cultural Services
- Yurrandaali Cultural Services
- Yulay Cultural Services
- Paul James McLeod
- Murra Bidgee Mullangari Aboriginal Corporation
- Muragadi
- Leanne Tungai
- South Coast Peoples
- Tungai Tonghi
- Shaun Carroll

A search conducted by the Office of the Registrar, *Aboriginal Land Rights Act 1983* (NSW) listed no Aboriginal Owners with land within the study area. A search conducted by the National Native Title Tribunal (NNTT) listed no Registered Native Title Claims, Unregistered Claimant Applications or Registered Indigenous Land Use Agreements within the study area. There was one unregistered Claimant Applications within the study area – South Coast Peoples (NC2017/008).

Upon registration, the Aboriginal parties were invited to provide their knowledge on the study area and on the proposal provided in the project information and methodology documents. Responses from the Registered Aboriginal Parties (RAPs) are included in Appendix 3.

The outcome of the previous consultation process (Biosis Pty Ltd 2017) was that the RAPs considered the study area to have a high level of cultural significance. Three Ducks Dreaming Surveying and Consulting believes there are many significant areas within the area, especially around the creeks and plains. The 2010 Aboriginal archaeological assessment conducted for the study area identified that the study area is considered to have high cultural significance due to the presence of Aboriginal archaeological sites and the study area proximity to Lake Illawarra, Duck Creek and Mount Brown (Biosis Research 2010). The results of the current consultation process are included in this document.

The recommendations that resulted from the consultation process are provided below.

Conclusions

This assessment has concluded that the proposed modification and subsequent development will not have any impacts on additional AHIMS sites or areas of archaeological potential.

Strategies have been developed based on the archaeological significance of cultural heritage relevant to the study area. The strategies also take into consideration:

- Predicted impacts to Aboriginal cultural heritage
- The planning approvals framework
- Current best conservation practice, widely considered to include:
  - Ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter
  - The Code.

The recommendations that resulted from the consultation process are provided below.

Management recommendations

Prior to any development impacts occurring within the study area, the following is recommended:

Recommendation 1: Application for an Aboriginal Heritage Impact Permit (AHIP) to conduct test excavations

Under Requirement 14 of the Code, test excavations within 50 metres of known or suspected shell midden sites are not permitted without an AHIP. Due to the presence of AHIMS 52-5-0223 (Boomberry Point 1) within the study area and the proximity of one possible midden, AHIMS 52-5-0643 (Gilba Road 2 Fill 1), it will be necessary to apply for an AHIP to conduct test excavations.

For information about AHIPs and their preparation, see below.

Advice preparing AHIPs

An AHIP is required for any activities likely to have an impact on Aboriginal objects or Places or cause land to be disturbed for the purposes of discovering an Aboriginal object. The Department of Environment, Energy and Science (EES) issues AHIPs under Part 6 of the *National Parks and Wildlife Act 1974* (NPW Act).

AHIPs should be prepared by a qualified archaeologist and lodged with the EES. Once the application is lodged processing time can take between 8-12 weeks. It should be noted that there will be an application fee levied by the EES for the processing of AHIPs, which is dependent on the estimated total cost of the development project. Where there are multiple sites within one study area an application for an AHIP to cover the entire study area is recommended.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the EES. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying the EES and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and EES's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by EES.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Cardno on behalf of Bridgehill Group to undertake an ACHA for the proposed Northern Precinct at Tallawarra, Yallah NSW.The purpose of this assessment is to support a development application for the proposed electrical transmission relocation in the Northern Precinct and to modify the existing concept approval for the Northern Precinct (MP 09_0131 MOD 1) to allow an increased residential lot yield.

A previous Aboriginal archaeological assessment for the Tallawarra Lands Part 3A Concept Plan (MP 09_0131) was conducted by Biosis in 2010. The previous assessment consisted of an Aboriginal archaeological survey, Aboriginal Community consultation, and Aboriginal archaeological test excavations (Biosis Research 2010). An impact assessment conducted as part of the 2010 assessment concluded that two Aboriginal archaeological sites Boomberry Point 1 (AHIMS 52-5-0223), and Elizabeth Point (AHIMS 52-5-0225); would be impacted on by the proposed development. Both Boomberry Point 1 (AHIMS 52-5-0223), and Elizabeth Point (AHIMS 52-5-0225) were assessed as having moderate archaeological significance. Boomberry Point 1 (AHIMS 52-5-0223) was assessed as having low subsurface archaeological potential, while Elizabeth Point (AHIMS 52-5-0225) was assessed as having moderate subsurface archaeological potential based on the results of the archaeological test excavations. Further assessment in the form of additional archaeological test excavations were recommended prior to development in order to establish the significance and extent of the archaeological resource.

The purpose of this assessment is to determine if the proposed modification will impact on any additional areas of archaeological potential or Aboriginal sites or objects. This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with the Code. The Code has been developed to support the process of investigating and assessing Aboriginal cultural heritage by specifying the minimum standards for archaeological investigation undertaken in NSW under the NPW Act. The archaeological investigation must be undertaken in accordance with the requirements of the code.

It is stated in section 1.2 of the Code that where the Aboriginal cultural heritage assessment concludes that the proposed activity will result in harm to Aboriginal objects or declared Aboriginal Places, an application for an AHIP will be required. This application must be supported by an ACHA and archaeological report (AR).

The *Environmental Planning and Assessment Act 1979* (EP&A Act) includes provisions for local government authorities to consider environmental impacts in land-use planning and decision making. Each Local Government Area (LGA) is required to create and maintain a Local Environmental Plan (LEP) that includes Aboriginal and historical heritage items. Local Councils identify items that are of significance within their LGA, and these items are listed on heritage schedules in the local LEP and are protected under the EP&A Act and *Heritage Act 1977.*

1.2 Study area

The study area is located within the Tallawarra North Precinct, Yallah NSW. It encompasses Lot 30 DP 1175058 and part Lot 31 DP 1175058, and is approximately 12 kilometres south west of Wollongong CBD (Figure 1). It encompasses 45.06 hectares of private land and the adjacent road reserves (Figure 2).

The study area is within the:

- Wollongong LGA.

- Parish of Calderwood.
- County of Camden.

The study area is bounded by Lake Illawarra to the east, the suburb of Koonawarra to the north, Energy Australia Tallawarra Power Station to the south, and rural land to the west.

1.3 Proposed development

The development of the Northern Precinct will comprise residential, open space and associated civil works (Figure 3). The modification to the concept approval seeks to increase the footprint and residential yield for the Northern Precinct from 310 lots to 403 lots. Currently approved components of the concept plan for the Northern Precinct include:

- Approximately 403 residential lots (22.3 hectares)
- Environmental management areas in the vicinity of Mount Brown
- Open space areas on the foreshore of Lake Illawarra (87 hectares)
- The Northshore Precinct has existing vehicular access via Gilba Road.

The following amendments are proposed to the Concept Plan for the Northern Precinct:

- Reduce the existing transmission easement width to accommodate a 15 metre wide corridor for underground transmission lines beneath a proposed road
- Expand the R2 zone (for low density residential land) south east into the E1 Public Recreation lands
- Expand the R2 Zone (for low density residential use) south into the E3 Environmental Management up to the ridge
- The composition of lots has been altered from the Concept Plan, with a new indicative layout that includes lots down to 300m2 and 12.5 metres frontages, where suited to the topography of the site.

Figure 1 Location of the study area - Tallawarra North Precinct

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping\

0 250 500 750 1,000
Metres
N
Scale 1:25,000 @ A4, GDA 1994 NSW Lambert

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Legend

Study area

Figure 2 Study area detail

0 50 100 150 200

Metres
Scale: 1:4,000 @ A3
Coordinate System: GDA 1994 NSW Lambert

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Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_AR_F2_StudyArea

Acknowledgements: Basemap © Land and Property Information 2016

Legend

Study area

Proposed development

Figure 3 Proposed development

0 50 100 150 200

Metres

Scale: 1:4,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_AR_F3_PropDevelop

1.4 Planning approvals

The proposed modification will be assessed against Part 3A section 75W of the EP&A Act. The DA will be assessed under Part 4 of the EP&A Act.

Other relevant legislation and planning instruments that will inform this assessment include:

- Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999.*
- NPW Act.
- NSW *National Parks and Wildlife Amendment Act 2010.*
- Infrastructure State Environmental Planning Policy 2007.
- Wollongong Development Control Plan 2009.

1.5 Restricted and confidential information

Appendix 1 in the AR contains AHIMS information which is confidential and not to be made public. This is clearly marked on the title page for the Attachment.

1.6 Aboriginal cultural heritage

1.6.1 General description

According to Allen and O'Connell (2003), Aboriginal people have inhabited the Australian continent for the last 50,000 years. New evidence out of the Northern Territory has pushed this date back to around 60,000 years with the Malakanunja II rock shelter dated at 61,000 +9000/-13,000 BP (Clarkson et al. 2015). In NSW, according to Bowler et al. (2003), Aboriginal people have occupied the land for over 42,000 years. However, preliminary evidence presented by Biosis (2016) from a subsurface testing program in south-western NSW suggests Aboriginal people may have occupied the semi-arid zone of the region for 50,000 years.

Without being part of the Aboriginal culture and the productions of this culture, it is not possible for non-Aboriginal people to fully understand the meaning of site, objects and places to Aboriginal people – only to move closer towards understanding this meaning with the help of the Aboriginal community. Similarly, definitions of Aboriginal culture and cultural heritage without this involvement constitute outsider interpretations.

With this preface Aboriginal cultural heritage broadly refers to things that relate to Aboriginal culture and hold cultural meaning and significance to Aboriginal people (DECCW 2010b, p.3). There is an understanding in Aboriginal culture that everything is interconnected. In essence Aboriginal cultural heritage can be viewed as potentially encompassing any part of the physical and/or mental landscape, that is, 'Country' (DECCW 2010b, p.iii).

Aboriginal people's interpretation of cultural value is based on their 'traditions, observance, lore, customs, beliefs and history' (DECCW 2010b, p.3). The things associated with Aboriginal cultural heritage are continually and actively being defined by Aboriginal people (DECCW 2010b, p.3). These things can be associated with traditional, historical or contemporary Aboriginal culture (DECCW 2010b, p.3).

1.6.2 Tangible Aboriginal cultural heritage

Three categories of tangible Aboriginal cultural heritage may be defined:

- Things that have been observably modified by Aboriginal people.

- Things that may have been modified by Aboriginal people but no discernible traces of that activity remain.
- Things never physically modified by Aboriginal people (but associated with Dreamtime Ancestors who shaped those things).

1.6.3 Intangible Aboriginal cultural heritage

Examples of intangible Aboriginal cultural heritage would include memories of stories and 'ways of doing', which would include language and ceremonies (DECCW 2010b, p.3).

1.6.4 Statutory

Currently Aboriginal cultural heritage, as statutorily defined by the NPW Act, consists of objects and places which are protected under Part 6 of the Act.

Aboriginal objects are defined as:

> *"any deposit, object or material evidence…relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains"*

Aboriginal places are defined as a place that is or was of special Aboriginal cultural significance. Places are declared under section 84 of the NPW Act.

1.6.5 Values

Aboriginal cultural heritage is valued by Aboriginal people as it is used to define their identity as both individuals and as part of a group (DECCW 2010b, p.iii). More specifically it is used:

- To provide a:
  - '*Connection and sense of belonging to Country*' (DECCW 2010b, p.iii).
  - Link between the present and the past (DECCW 2010b, p.iii).
- As a learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public (DECCW 2010b, p.3).
- As further evidence of Aboriginal occupation prior to European settlement for people who do not understand the magnitude to which Aboriginal people occupied the continent (DECCW 2010b, p.3).

2 Study area context

This section discusses the study area in regards to its landscape, environmental and Aboriginal cultural heritage context. This section should be read in conjunction with the archaeological report attached in Appendix 6. The background research has been undertaken in accordance with the Code.

2.1 Topography and hydrology

The Illawarra region forms part of the Sydney Basin; a geological basin filled with near horizontal sandstones and shales of Permian to Triassic age overlying older basement rocks of the Lachlan Fold Belt. The Illawarra subregion of the Sydney Basin is characterised by Permian siltstones, shale, sandstones and interbedded volcanics on and below the coastal escarpment. The geology of the region provides useful stone resources for toolmaking, included volcanic rocks useful for manufacture of edge ground axes.

The study area is situated on the Coastal Plain on the edge of Lake Illawarra and the Escarpment. This physiographic unit has formed from the gradual recession westward of the Plateau (Bowman 1971). The Coastal Plain is characterised as a mosaic of foothills, ridges, spurs, hillocks and floodplains with slopes varying from very gently inclined to steep with the occasional low cliff. It is dissected by easterly flowing streams at intervals that become more frequent towards the north (Fuller 1982, p.18). The Coastal Plain is widest at the points where Macquarie Rivulet has entrenched into the Plateau at Macquarie Pass and where other waterways that provide the catchment area of Lake Illawarra, such as Duck and Wollingurry Creek systems, have carved into the Escarpment (Bowman 1971).

The Northern Precinct is located approximately 50 metres inland from the shore of Lake Illawarra. Lake Illawarra was formed from the drowning of the Macquarie Rivulet valley during the raising of Holocene sea levels (6-7,000 years ago); the estuary was subsequently formed behind the large sand barrier that now forms the Windang Peninsula. Lake Illawarra is the largest estuarine lagoon on the south coast of NSW, covering an area of 33 square kilometres and extending over 9 kilometres in length and 5 kilometres in width. It receives salt water from the Pacific Ocean and fresh water from the Illawarra Escarpment (Roy 1984). Lake Illawarra is classified as an early Intermediate Barrier Estuary or an estuarine lagoon. Barrier estuaries are characterised by 'narrow elongated entrance channels with broad tidal and back barrier sand flats' (Roy 1984, p.5).

The proximity to Lake Illawarra would have provided abundant food resources and is likely to result in the presence of Aboriginal sites, such as middens, in the vicinity of the study area.

2.2 Climate

The climate within the study area is generally temperate with a maritime influence. Summers in the coastal regions are generally warm, while winters are mild. In the escarpment areas to the west, winters are cold. Moderate to high temperatures, high humidity, onshore winds and peak rainfall characterise summer and autumn (Hazelton 1992). One third of the mean annual rainfall occurs between January and March, with a secondary rainfall peak in June. Winter winds are predominantly westerly, producing drier, cooler conditions.

2.3 Soil landscapes

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise

archaeological potential and exposure. The study area contains one erosional soil landscape called the Shellharbour soil landscape. Erosional soil landscapes comprise soils that are derived from the erosive action of running water, primarily well-defined streams that have the ability to transport their sediment load. Soils may be either absent, derived from water-washed parent materials, or derived from *in situ* weathered bedrock.

The characteristics of the Shellharbour soil landscape are summarised in Table 1.

Table 1 Shellharbour soil landscape characteristics (Hazelton 1992, pp.58–60)

Soil Landscape	Topography	Soils
Shellharbour	Rolling low hills with long side slopes and broad drainage lines. Relief 30-50 metres. Slopes <20% incline.	Crests and upper slopes: Hard setting black rich clays overlying <100 cm of brown strongly pedal heavy clay. Mid slopes: Up to 20 cm of brownish black sandy loam overlies <50 cm of strongly pedal reddish brown sandy clay. 50 cm of mottled reddish brown sandy clay overlies <50 cm of brown strongly pedal heavy clay. Foot slopes and drainage plains: Up to 40 cm of reddish brown sandy clay overlies >50 cm of strongly pedal brown heavy clay.

The Shellharbour soil landscape has a high to very high erodibility rating would therefore be susceptible to frequent soil movement. This would result in poor preservation of archaeological material at shallow depths but would potentially lead to exposures of any deeper archaeological deposits were topsoil has eroded away.

2.4 Landscape resources

The Coastal Plain of the Illawarra region provides a number of resources used by Aboriginal inhabitants. The geology of the region provides an abundant supply of raw materials. Quartz is the main stone raw-material type suitable for Aboriginal tool manufacture that is likely to occur in the vicinity of the study area in any abundance. This would have been available locally and also from trading with other groups (Donlon & Sefton 1988, p.23). Igneous material would have come from the south of the study area in areas like Gerringong (Donlon & Sefton 1988, p.55) due to its volcanic nature. Some of the other fined grain siliceous material may have come from the Cumberland Plain. Silcrete cobbles are known to have occurred along the Cumberland Plain (McDonald 1992), to the north of the study area. Elsewhere on the Plain, the potential raw materials for stone artefact making include silicified wood, tuff, mudstone, quartz, quartzite and basalt. River gravels and cobbles containing silcrete, chert, and other fine grained volcanic rocks were also used (Attenbrow 2010). While previous archaeological work within the region has not identified any specific stone sources, the presence of the volcanic Dapto Latite Member in the region may have provided a suitable source of raw material, providing lithic material for stone axes. Resources would have been accessible in the outcrops of siltstone, shale and tuffaceous sandstones of the Berry Siltstone formation.

Aerial imagery and vegetation mapping undertaken by the National Parks and Wildlife Service (NPWS) shows that the study are has been cleared of native vegetation; however, native vegetation communities in the vicinity of the study area and around Lake Illawarra would have been comparable to vegetation found in the study area prior to clearing. These vegetation communities include

- Lowland Woollybutt – Melaleuca Forest located on flat low-lying Shoalhaven Group sediments at elevations between 10 and 35 metres above sea level. It is characterised by the presence of Woolybutt (*Eucalyptus longifolia*), Stringybark (*E. globoidea/E. eugenioides*), and Honey Myrtle (*Melaleuca decora).*
- Coastal Swamp Oak Forest occurring in estuarine environment that include low-lying areas of coastal floodplain and the fringes of lakes and lagoons. Common and abundant species that occur include Swamp Oak (*Casuarina glauca*) , Common Reed (*Phragmites australis*), and various sedges

A number of these plant species would have been used by Aboriginal groups to make various wooden implements. Wood from the Swamp Oak was used to make tools such as nulla nullas, while the bark was removed and made into canoe hulls (Robinson 1991, p.152).

Local Aboriginal groups would have had access to an abundant range of marine, terrestrial and avian species present in the coastal resource zone which would have provided a variety of uses. Marine animals such as cockles, lobster and periwinkles were eaten (Wesson 2009). Abalone and stingrays were also used to make fish hooks and tools in addition to their use as a food source. Terrestrial species on the coastal plain, such as kangaroos, possums and wombats would have been exploited for food and to make cloaks, and tools (Attenbrow 2010). Avian species were used as a food source, and in the case of the pelican and black duck were often totem animals for Aboriginal groups (Wesson 2009).

2.5 Land use history

Within the proposed study area, soil disturbance is associated with historic pastoral land-use practices and recreational usage. The entire area between Koonawarra and Yallah bays have been subjected to extensive grazing and agricultural practices from 1880s onwards. As well as vegetation clearing for pasture and agriculture, other land disturbances within the property include construction of the high voltage transmission lines and towers; recreational usage resulting in impact trails particularly by trail bikes and pedestrian traffic in the low lying areas along the foreshore.

Although these past land activities caused disturbances, they may have impacted only the surface contexts of any existing Aboriginal archaeological site; it is unlikely that they would have destroyed sites. Clearing of the land would have most likely removed a great number of native culturally modified trees.

3 Aboriginal cultural heritage context

3.1 Ethnohistory

Despite a proliferation of known indigenous sites there is considerable ongoing debate about the nature, territory and range of pre-contact indigenous language groups in the greater Sydney region. These debates have arisen largely due to the lack of ethnographic and linguistic information recorded at the time of European contact. By the time colonial diarists, missionaries and proto-anthropologists began making detailed records of indigenous people in the late 19th century, pre-European indigenous groups had been broken up and reconfigured by European settlement activity. The following information relating to indigenous people on the Illawarra is based on early ethnographic accounts.

Despite conflicting views between historical sources of the exact boundaries of tribal groups in the region, the linguistic evidence does identify distinct language groups at the time of European contact. Based on this information it appears that the study area was situated within the Tharawal (also Dharawal, Darawal, Carawal, Turawal, Thurawal) linguistic group. The named groups (often referred to as 'clans', 'bands' or 'tribes') belonging to the Tharawal/Dharawal language group included the following: Gweagal, Norongerraga, Illawarra, Threawal, Tagary, Wandeandega, Wodi Wodi and Ory-ang-ora (Tindale 1974). In his overview of Australian Aboriginal tribal boundaries, Tindale (1974), places the Illawarra area within the territories of the Wodi Wodi tribe (or 'named group'). Tindale (1940, pp.194–195) describes the Wodi Wodi named group as occupying the area north of the Shoalhaven River to Wollongong.

The areas inhabited by each of the groups are considered to be indicative only and would have changed through time and possibly due to circumstances (i.e. availability and distribution of resources). The type and quantity of interactions between different social groupings would have varied with seasons and resource availability. Interactions between the groups inhabiting the many resource zones of the Sydney Basin (coastal and inland) would have varied but been continuous. This is reflected in the relatively homogenous observable cultural features such as art motifs, technology and resource use (McDonald 1992).

Ethnographic evidence considered by Donlon and Sefton (1988, pp.22–29) indicates high population mobility on the Woronora Plateau with frequent contact between the neighbouring Gandangarra, Cobrakall (Liverpool and Cabramatta) and Wodi Wodi (Illawarra). The traditional Wodi Wodi land extended from around Stanwell Park to the Shoalhaven River, and as far inland as Picton, Moss Vale and Marulan. The Wodi Wodi spoke the Dharawal language, however Dharawal (Tharawal) was not a word they had heard of or used themselves (Tindale 1974, Navin Officer Heritage Consultants 2000). Many of the town and place names of the Illawarra are derived from the Dharawal language.

The first European explorers in the area were Bass and Flinders when they travelled to Port Kembla in 1796. Flinders wrote about 'Canoe River' in his journal, making reference to the Lake Illawarra entrance (Organ 1990, p.11).

> *'This part is called Alowrie, by the natives, and is very low and sandy near the sides of the rivulet. About four miles up it, to the north-west, is the lagoon: and behind, stands a semi-circular range of hills, of which the highest is Hat Hill. The water in the lagoon was distinctly seen, and appeared to be several miles in circumference. The land around it is probable fertile, and the slopes of the back hills had certainly that appearance.'*

Lake Illawarra also provided a rich variety of food resources. Allan Cunningham, Government Botanist, wrote in 1818:

...we came out upon the margin of the Lake, which is extensive, but very shoaly on its expanded surface. Pelicans, ducks and teal and some other aquatic birds were swimming, and in detached parties I observed natives of the Lake...in canoes, spearing fish, which is said to be abundant.

After the arrival of European settlers the movement of Aboriginal hunter-gatherers began to be increasingly restricted. European expansion was swift following the initial exploration by Bass and Flinders, and soon there had been considerable loss of land to agriculture. This led to violence and conflict between Europeans and Aboriginal people as both groups sought to compete for the same resources (Attenbrow 2010). At the same time diseases such as small pox were having a devastating effect on the Aboriginal population. Death, starvation and disease were some of the disrupting factors that led to a reorganisation of the social practices of Aboriginal communities after European contact.

The formation of new social groups and alliances were made as Aboriginal people sought to retain some semblance of their previous lifestyle. In 1820, approximately 3000 Aboriginal people were living in the Illawarra, but by 1899 their numbers had declined to only 33 people of non-mixed descent (Organ 1990). Today many Wodi Wodi and Tharawal people continue to live in the Illawarra.

3.2 Aboriginal heritage located in the study area

The archaeological assessment of the study area identified the following Aboriginal sites in the study area:

- Boomberry Point 1 (AHIMS 52-5-0223)
- Elizabeth Point (AHIMS 52-5-0225)

The following Aboriginal sites are located within 10 metres of the study area:

- Gilba Road 1 (52-5-0642) - The location of Gilba Road 1 (52-5-0642) has been incorrectly recorded on the AHIMS database. A review of the site card and description indicates that this site is located along Gilba Road within 10 metres of the study area
- Gilba Road 2 Fill 1 (AHIMS 52-5-0643)

One area of moderate subsurface archaeological potential was identified within the study area. The archaeological report attached in Appendix 5 provides details for Aboriginal sites and areas of potential identified during the archaeological assessment. Figure 4 details the Aboriginal sites within the study area. Areas of archaeological potential arte shown in Figure 5. A brief description of each site is provided below.

AHIMS 52-5-0223 Boomberry Point 1

Boomberry Point 1 is recorded as a small dispersed shell midden comprising of *Andara trapezia*. It is likely that Boomberry Point 1 has been mapped incorrectly as the site card describes its location as being located on the track running from Tallawarra Power Station to Boomberry Point across Tallawarra Point Headland, three metres south of an unnamed creekline. It was noted that the soil matrix is slightly darker than the surrounding soil and is probably related to the breakdown of charcoal. The highly fragmented shell was visibly exposed on the track and extended under the grass on the side of the track towards the creekline. No artefacts were found even though visibility on the track was 100%. The site is heavily disturbed by horse traffic and the deposition of building rubble and rubbish.

AHIMS 52-5-0225 Elizabeth Point

Elizabeth Point is recorded as an isolated artefact consisting of a grey chert flake fragement. The site is located along a walking track from Tallawarra Power Station to Boomberry Point across Tallawarra Point

Headland. It is also likely that Elizabeth Point has been mapped incorrectly as its current location is further west.

AHIMS 52-5-0642 Gilba Road 1

Gilba Road 1 is recorded as an isolated artefact located at the beginning of a walking track towards Boomberry Point. This site is currently mapped in the middle of Lake Illawarra; therefore, is also incorrectly mapped and the site is likely located at the end of Gilba Road within 10 metres of the study area.

AHIMS 52-5-0643 Gilba Road 2 Fill 1

Gilba Road 2 Fill 1 is recorded as an isolated artefact; however, the location is not described. The site card does include a map showing the location of shell scatter adjacent to the walking track, which extends for approximately 120 metres.

Area of moderate archaeological potential

The area of moderate archaeological potential identified in the 2010 Biosis assessment was redefined based on the findings of the predictive statement and the field survey. The low spur/crest running roughly east-west through the centre of the study area has been assessed as having moderate subsurface archaeological potential. Previous research indicates that the landform is likely contain low density artefact sites or isolated artefacts that were discarded as Aboriginal people travelled through the landscape. The test excavation program conducted by Biosis in 2010 indicated that this landform unit has been subject to low levels of previous ground disturbance with four distinct and intact soil horizons identified throughout the testing locations in the northern precinct.

3.3 Interpretation of past Aboriginal land use

Ethno-historical information points out that the area was intensively occupied by people of the Dharawal language group. Tangible evidence of this occupation is reflected across the landscape by many recorded sites around Lake Illawarra, the majority of them shell middens and artefacts.

Previous archaeological work around Lake Illawarra has recognised archaeological and cultural landscape values of the locality. All of the previous studies provide a general overview of the Aboriginal archaeological site patterning and predictive behaviour around the lake. Results of previous archaeological assessments indicate that areas of archaeological potential will occur where disturbance has been limited in all the landforms around the lake, with shell middens and artefact sites most likely to be present in the area (Figure 5).

Due to the proximity of the study area to Lake Illawarra, it would have provided have provided access to a range of terrestrial and aquatic flora and fauna species that could be utilised by Aboriginal groups in the region. Aquatic species in the area would have included a range of shellfish species that could be exploited, and this would result in the potential for shell midden sites in the study area. Several sites are recorded in the study area, including three isolated artefacts and a shell midden (Figure 4). This indicates that the study area was utilised by Aboriginal people in the past.

Legend

- Study area
- AHIMS record

Figure 4 AHIMS records near the study area

NOT TO BE MADE PUBLIC

0 500 1,000 1,500

Metres

Scale: 1:35,000 @ A3

Coordinate System: GCS GDA 1994

biosis

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Sydney,Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: amurray, Generated by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_F4_AHIMS.mxd

Legend

Study area

Archaeological potential

Moderate

Low

Figure 5 Archaeological potential

0 50 100 150 200

Metres

Scale: 1:4,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
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Acknowledgements: Basemap © Land and Property Information 2016

4 Aboriginal community consultation

Consultation with the Aboriginal community has been undertaken in compliance with the consultation requirements as detailed below. Community consultation has been restarted due the lapse in consultation of more than six months. This was confirmed in discussions EES. This ACHA includes the current community consultation and a consultation log of all communications with RAPs is provided in Appendix 1 and Appendix 6.

4.1 Stage 1: Notification of project proposal and registration of interest

4.1.1 Identification of relevant Aboriginal stakeholders

In accordance with the consultation guidelines, Biosis Pty Ltd notified the following bodies regarding the Proposal:

- Wollongong City Council.
- EES.
- NSW Native Title Services Corporation Limited (NTSCORP Limited).
- Office of the Registrar, Aboriginal Land Rights Act 1983 of Aboriginal Owners.
- NNTT.
- South Coast Local Land Services.
- ILALC.

A list of known Aboriginal stakeholders in the Illawarra was provided by EES (a copy of these responses are provided in Appendix 2) and included:

- Badu (Murrin Clan/Peoples)
- Barraby Cultural Services
- Bellambi Indigenous Corporation Gandangara Traditional Owners
- Biamanga (Murrin Clan/Peoples)
- Bilinga (Murrin Clan/Peoples)
- Darryl Caines
- Gary Caines
- Coomaditchie United Aboriginal Corporation
- Cullendulla (Murrin Clan/Peoples)
- Darug Land Observations
- Kullila Site Consultants and Koori Site Management
- La Perouse Botany Bay Corporation
- Minnamunnung
- Munyunga (Murrin Clan/Peoples)
- Mura Indigenous Corporation (icn:8991)
- Murramarang (Murrin Clan/Peoples)
- Murra Bidgee Mullangari Aboriginal Corporation
- Murrumbul (Murrin Clan/Peoples)
- NIAC
- Nundagurri (Murrin Clan/Peoples)

- James Davis
- Dharug (Murrin Clan/Peoples)
- Duncan Falk Consultancy
- Ken Foster
- Gadhu Dreaming
- Raymond Garbutt
- Garrara Aboriginal Corporation
- Goobah Development PTY LTD (Murrin Clan/Peoples)
- Gumaraa
- Gundungurra Tribal Technical Services
- Gunyuu (Murrin Clan/Peoples)
- Guunamaa Dreamin Sites and Surveying
- Illawarra Aboriginal Corporation
- Illawarra Local Aboriginal Land Council
- Gundungurra Tribal Technical Services
- Gundungurra Tribal Technical Services
- Jerringong (Murrin Clan/Peoples)
- Karrial (Murrin Clan/Peoples)
- Korewal Elouera Jerrungurah Tribal Elders Council
- Pemulwuy (Murrin Clan/Peoples)
- Norma Simms
- South West Rocks Corporation
- Three Ducks Dreaming Surveying and Consulting
- Thoorga Nura
- Tungai Tonghi
- Leanne Tungai
- The Wadi Wadi Coomaditchie Aboriginal Corporation
- The Wadi Wadi Coomaditchie Aboriginal Corporation (correspondence via NIAC)
- Walbunja (Murrin Clan/Peoples)
- Walgalu (Murrin Clan/Peoples)
- Warra Bingi Nunda Gurri
- The Wodi Wodi Elders Corporation
- Woronora Plateau Gundungara Elders Council
- Wullung (Murrin Clan/Peoples)
- Yerramurra (Murrin Clan/Peoples)
- Yurrandaali Cultural Services
- South Coast Peoples

A search conducted by the Office of the Registrar, *Aboriginal Land Rights Act 1983* (NSW) listed no Aboriginal Owners with land within the study area. A search conducted by the NNTT listed no Registered Native Title Claims, Unregistered Claimant Applications or Registered Indigenous Land Use Agreements within the study area. There was one unregistered Claimant Applications within the study area – South Coast Peoples (NC2017/008).

4.1.2 Public notice

In accordance with the consultation guidelines, a public notification was placed in the following newspapers:

- *Illawarra Mercury* (24 August 2019).

The advertisement invited Aboriginal people who hold cultural knowledge to register their interest in a process of community consultation to provide assistance in determining the significance of Aboriginal object(s) and/or places in the vicinity of the study area. A copy of the public notice is provided in Appendix 2.

4.1.3 Registration of Aboriginal parties

Aboriginal groups identified in Section 4.1.1 were sent a letter inviting them to register their interest in a process of community consultation to provide assistance in determining the significance of Aboriginal object(s) and/or places in the vicinity of the study area. In response to the letters and public notice, a total of 14 groups registered their interest in the project. Responses to registration from Aboriginal parties are provided in Appendix 3. A full list of Aboriginal parties who registered for consultation is provided below:

- Illawarra Local Aboriginal Land Council
- Woronora Plateau Gundangara Elders Council
- James Davis
- Warra Bingi Nunda Gurri
- Guunamaa Dreamin Sites and Surveying
- Gumaraa
- Yerramurra (Murrin Clan/Peoples)
- Duncan Falk Consultancy
- Shaun Carroll
- Barraby Cultural Services
- Yurrandaali Cultural Services
- Yulay Cultural Services
- Paul James Mcleod
- Murra Bidgee Mullangari Aboriginal Corporation
- Muragadi
- Leanne Tungai
- South Coast Peoples
- Tungai Tonghi

4.2 Stage 2: Presentation of information about the proposed project

On 19 September 2019 Biosis provided RAPs with details about the proposed development works (project information pack). A copy of the project information pack is provided in Appendix 3.

4.3 Stage 3: Gathering information about cultural significance

4.3.1 Archaeological assessment methodology information pack

On 19 September 2019 Biosis provided each RAP with a copy of the project methodology outlining the proposed Aboriginal cultural heritage assessment process and methodology for this project. RAPs were given 28 days to review and prepare feedback on the proposed methodology. A copy of the project methodology pack is provided in Appendix 3.

From the 2017 ACHA, Biosis received comments from several RAPs, including Three Ducks Dreaming Surveying and Consulting, Darug Land Observations, Biamanga (Murrin Clan/Peoples), Cullendulla (Murrin Clan/Peoples), Goobah Development Pty Ltd (Murrin Clan/Peoples) and Murramarang (Murrin Clan/Peoples), who agreed with the project methodology. Three Ducks Dreaming Surveying and Consulting requested that any artefacts found are provided to the Illawarra Local Aboriginal Land Council for future educational design projects.

This current ACHA, Yulay Cultural Services, Barraby Cultural Services, Yurrandaali Cultural Services, Murra Bidgee Mullangari Aboriginal Corporation, Muragadi and Shaun Carroll all agreed with the methodology.

4.4 Stage 4: Review of draft Aboriginal cultural heritage assessment report

To be completed following the review and comments of the current ACHA from RAPs after the statutory 28 day period.

Responses from the 2017 ACHA were received from Three Ducks Dreaminig, Guunamaa Dreaming Site and Surveying, Murramarang (Murrin Clan/Peoples), Cullendulla (Murrin Clan/Peoples), Biamanga (Murrin Clan/Peoples), Goobah Development Pty Ltd (Murrin Clan/Peoples) and Duncan Falk Consultancy. All groups agreed with the draft report. Duncan Falk Consultancy recommending that any artefacts found are reburied in an agreed location where they will not be impacted upon in the future, and also confirmed that Duncan Falk Consultancy holds evidence regarding language boundaries, noting that Dharawal ranged from the Illawarra to Bong Bong now known as the Southern Highlands and surrounding areas. Guunamaa Dreaming Sites and Surveying requested that only Aboriginal groups from the Illawarra be involved in any further work. Three Ducks Dreaming Surveying and Consulting believes there are many significant areas within the area, especially around the creeks and plains.

5 Aboriginal cultural significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess the cultural values of Aboriginal sites in the study area. Details of the scientific significance assessment of Aboriginal sites in the study area are provided in Appendix 5.

5.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) *Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS 2013) ('the Burra Charter'). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives *in situ*, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Australian

Government, the NSW OEH and the Heritage Branch, and the NSW Department of Planning and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the OEH *Guidelines to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists and the Aboriginal community. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

5.2 Cultural (social significance) values

Cultural or social significance refers to the spiritual, traditional, historical and/or contemporary associations and values attached to a place or objects by Aboriginal people. Aboriginal cultural heritage is broadly valued by Aboriginal people as it is used to define their identity as both individuals and as part of a group (DECCW 2010b, p.iii). More specifically it provides:

- A '*connection and sense of belonging to Country*' (DECCW 2010b, p.iii).
- A link between the present and the past (DECCW 2010b, p.3).
- A learning tool to teach Aboriginal culture to younger Aboriginal generations and the general public (DECCW 2010b, p.3).
- Further evidence of Aboriginal occupation prior to European settlement for people who do not understand the magnitude to which Aboriginal people occupied the continent (DECCW 2010b, p.3).

It is acknowledged that Aboriginal people are the primary determiners of the cultural significance of Aboriginal cultural heritage. Table 2 below outlines areas identified as having Aboriginal cultural significance based on the previous Aboriginal consultation for the study area in 2010 (Biosis Research 2010).

Table 2 Areas of Aboriginal cultural sensitivity, identified through stakeholder consultation in Biosis (2010)

Defined area of Aboriginal cultural sensitivity	Description of component area	Identified cultural values
Duck Creek	Easterly trending creek with fluvial deposits located on the southern and northern banks of the creek.	It would have been used as an access way to the lake and for its resources.
Fig Tree	SSE trending basal slope	Men's business or women's business, a meeting place, birthing tree
Lake Illawarra Foreshore	Open, sloping lake shores and floodplain / swamp land	The lake itself, the foreshore, the midden sites and its association with the birth of Queen Rosie.
Wollingurry Point	Open low slope towards Lake Illawarra	Large midden site situated on a point that extends out into the lake
Ridgeline Access – Mt Brown to the Lake	Steep to moderate slopes trending south east towards Lake Illawarra	Ridgeline - access way from Mt Brown to Lake Illawarra - camping - vista.
Mount Brown	Steep to moderate slopes trending south east towards Lake Illawarra	Mt Brown – lookout.

5.3 Historic values

Historic significance refers to associations a place or object may have with a historically important person, event, phase or activity to the Aboriginal and other communities. The study area is not known to have any historic associations.

5.4 Archaeological (scientific significance) values

An archaeological (scientific) assessment was undertaken for the study area and is presented in detail as part of the attached Archaeological Report (Appendix 5).

5.5 Aesthetic values

The study area is located in close proximity to Lake Illawarra with some areas of disturbance present throughout. The landscape of the study area has undergone tree clearing and farming practices but due to its proximity to Lake Illawarra and Mount Brown is still closely linked with Aboriginal cultural values and provides a context for Aboriginal sites that gives a strong sense of place.

5.6 Statements of significance

The significance of the Aboriginal sites has been assessed in accordance with the following criteria:

- Requirements of the Code.

- The Burra Charter.
- Guide to Investigating and reporting on Aboriginal Heritage.

The combined use of these guidelines is widely considered to represent the best practice for assessments of Aboriginal cultural heritage. The identification and assessment of cultural heritage values includes the four values of the Burra Charter: social, historical, scientific and aesthetic values. The resultant statement of significance has been constructed for the study area based on the significance ranking criteria assessed in Table 3.

5.6.1 Statement of significance for Boomberry Point 1 (AHIMS 52-5-0223)

Boomberry Point 1 (52-5-0223) consisted of shell midden containing one shell species. The site was exposed on the side of a track in a hill slope landform. The site was noted to be badly disturbed with highly fragmented shell. The site has no direct historical associations and has low scientific potential. The site is located in on an access track in close proximity to Lake Illawarra. It has moderate aesthetic significance due to Lake Illawarra, but is heavily disturbed. The significance of this site has been assessed as low.

5.6.2 Statement of significance for Elizabeth Point 1 (AHIMS 52-5-0225)

Elizabeth Point 1 (52-5-0225) was recorded as an isolated stone artefact located on a walking track. The artefact was a grey chert flake piece, common in the region and was observed to have been disturbed by the walking track. The site has no direct historical associations and has low scientific potential. It has moderate aesthetic significance due to Lake Illawarra, but is heavily disturbed. The significance of this site has been assessed as low.

5.6.3 Statement of significance for Gilba Road 1 (AHIMS 52-5-0642)

Gilba Road 1 (52-5-0642) was recorded as a stone artefact located at the very beginning of a concrete pathway. Based upon the location of this artefact and current aerial imagery, the artefact has been disturbed as a concrete pathway now extends through the area that the artefact was initially found in. The site has no direct historical associations and has low scientific potential. The site is located on the Lake Illawarra foreshore next to a concrete bicycle track. It has moderate aesthetic significance due to its proximity to Lake Illawarra. The significance of this site has been assessed as low.

5.6.4 Statement of significance for Gilba Road 2 Fill (AHIMS 52-5-0643)

Gilba Road 2 Fill (52-5-0643) site was recorded as an artefact located in an area of fill, with shell and pottery also present. The location of the artefact in an area of fill indicates that it has been disturbed. The site has no direct historical associations and has low scientific potential. The site is located on the Lake Illawarra foreshore in an area of fill. It has moderate aesthetic significance due to its proximity to Lake Illawarra. The significance of this site has been assessed as low.

Table 3 Significance assessment criteria

Site name	Criteria	Ranking
Boomberry Point 1 52-5-0223	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	High
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site contains a shell midden with one species present. The site type is common in the region, and it is located in an area of previous disturbance. It is assessed with low scientific	Low

Site name	Criteria	Ranking
	significance.	
	Aesthetic – the site is located in on an access track in close proximity to Lake Illawarra. It has moderate aesthetic significance due to Lake Illawarra, but is heavily disturbed.	Moderate
Elizabeth Point 1 **52-5-0225**	Cultural – discussions with the local Aboriginal communities reflect that all sites are high in value.	High
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site contains an isolated artefact which is common in the region. The site is located on a walking track and is disturbed. It is assessed with low scientific significance.	Low
	Aesthetic – the site is located in on an access track in close proximity to Lake Ilawarra. It has moderate aesthetic significance due to its location.	Moderate
Gilba Road 1 **52-5-0642**	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	High
	Historical – the site is not connected to any historical event or personage.	Low
	Scientific – the site contains an isolated artefact common in the region, and which is located in an area of previous disturbance. It is assessed with low scientific significance.	Low
	Aesthetic – the site is located on the Lake Illawarra foreshore next to a concrete bicycle track. It has moderate aesthetic significance due to its proximity to Lake Illawarra.	Moderate
Gilba Road 2 Fill **52-5-0643**	Cultural – discussions with the local Aboriginal communities reflect that the site is high in value.	High
	Historical – the site is not connected to any historical event or personage. It is assessed with low historical significance	Low
	Scientific – the site contains an isolated artefact common in the region, and which is located in an area of previous disturbance. It is assessed with low scientific significance.	Low
	Aesthetic – the site is located on the Lake Illawarra foreshore in an area of fill. It has moderate aesthetic significance due to its proximity to Lake Illawarra.	Moderate

6 Proposed development limitations & mitigation measures

As previously outlined, Cardno on behalf of Bridgehill is proposing to submit a development application for the Tallawarra Lands Northern Precinct and to modify the existing concept approval for the Northern Precinct (MP 09_0131 MOD 1) to allow an increased residential lot yield.

The proposed development will involve the following activities that have the potential to impact on Aboriginal archaeological sites or objects:

- Earthworks.
- Subdivision.
- New housing stock.
- Public open space areas.
- New recreation facilities.
- Environmental management and conservation areas and riparian corridors.
- New internal roads.
- New pedestrian and cycle pathways.
- Landscaping.
- Power station buffer areas.
- Installation of services (water, gas, power).

The following amendments are proposed to the Concept Plan in the Northern Precinct:

- Reduce the existing transmission easement width to accommodate a 15 metre wide corridor for underground transmission lines beneath a proposed road.
- Expand the R2 zone (for low density residential land) south east into the E1 Public Recreation lands.
- Expand the R2 Zone (for low density residential use) south into the E3 Environmental Management up to the ridge.
- The composition of lots has been altered from the Concept Plan, with a new indicative layout that includes lots down to 300m^2 and 12.5 metres frontages, where suited to the topography of the site.

6.1 Predicted physical impacts

The proposed modification and associated development will not impact on any additional Aboriginal sites or areas of archaeological potential. Within the study area, there are two recorded Aboriginal sites that may be subject to harm (52-5-0223, and 52-5-0225). It is expected that the potential of harm to 52-5-0223, and 52-5-0225 from the proposed development will be direct, with a total loss of value.

Two AHIMS sites (52-5-0642, and 52-5-0643) are located within 10 metres of the study area, and may be subject to harm. It is expected that the potential of harm to 52-5-0642, and 52-5-0643 from the proposed development will be indirect, with a partial loss of value.

Strategies to avoid or minimise harm to Aboriginal heritage in or near the study area are discussed below. A summary of impacts is provided below in Table 4. Figure 6 shows the proposed development footprint and the AHIMS sites in and adjacent to the study area.

Table 4 Summary of potential archaeological impacts

AHIMS site no.	Site name	Significance	Type of harm	Degree of harm	Consequence of harm
52-5-0223	Boomberry Point 1	Low	Direct	Total	Total loss of value
52-5-0225	Elizabeth Point	Low	Direct	Total	Total loss of value
52-5-0642	Gilba Road 1	Low	Indirect	Partial	Partial loss of value
52-5-0643	Gilba Road 2 Fill	Low	Indirect	Partial	Partial loss of value

6.2 Avoiding harm to Aboriginal heritage

Aboriginal sites Boomberry Point 1 (AHIMS 52-5-0223), and Elizabeth Point (AHIMS 52-5-0225), and the area of moderate archaeological potential are located within the centre of the development footprint and impacts cannot be avoided by the proposed development. Aboriginal sites Gilba Road 1 (AHIMS 52-5-0642) and Gilba Road 2 Fill (AHIMS 52-5-0643) are located within 10 metres of the area of proposed works. The proposed works are not expected to directly impact on these sites. Strategies to avoid or minimise harm to Aboriginal heritage in or adjacent to the study area are discussed below.

6.3 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of 'doing as much as necessary, as little as possible' (Australia ICOMOS 2013). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable.

Boomberry Point 1 (AHIMS 52-5-0223) and Elizabeth Point (AHIMS 52-5-0225) are currently located within the proposed development area and impacts cannot be avoided. It is therefore recommended that an archaeological test excavation program be conducted within the vicinity of these two sites. Under Requirement 14 of the Code, test excavations within 50 metres of known or suspected shell midden sites are not permitted without an AHIP. Due to the presence of AHIMS 52-5-0223 (Boomberry Point 1) within the study area and the proximity of one possible midden, AHIMS 52-5-0643 (Gilba Road 2 Fill 1), it will be necessary to apply for an AHIP to conduct test excavations.

Previous assessments, including a limited archaeological test excavation program conducted by Biosis (2010), identified an area of moderate subsurface archaeological potential within the study area. Further testing is therefore recommended in the area of moderate archaeological potential prior to development, to fully identify the nature and extent of Aboriginal occupation within the study area.

Legend

- Study area
- Proposed development
- AHIMS record

Figure 6 Proposed development with AHIMS

0 50 100 150 200

Metres
Scale: 1:4,000 @ A3
Coordinate System: GDA 1994 NSW Lambert

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_F6_AHIMSDevelop

7 Recommendations

The recommendations below respond specifically to the wishes of the registered Aboriginal parties. Recommendations regarding the archaeological value of the site, and the subsequent management of Aboriginal cultural heritage is provided in the archaeological report (Appendix 5).

Recommendation 1: Application for an AHIP to conduct test excavations

Under Requirement 14 of the Code, test excavations within 50 metres of known or suspected shell midden sites are not permitted without an AHIP. Due to the presence of AHIMS 52-5-0223 (Boomberry Point 1) within the study area and the proximity of one possible midden, AHIMS 52-5-0643 (Gilba Road 2 Fill 1), it will be necessary to apply for an AHIP to conduct test excavations.

For information about AHIPs and their preparation, see below.

Advice preparing AHIPs

An AHIP is required for any activities likely to have an impact on Aboriginal objects or Places or cause land to be disturbed for the purposes of discovering an Aboriginal object. The EES issues AHIPs under Part 6 of the NPW Act.

AHIPs should be prepared by a qualified archaeologist and lodged with the EES. Once the application is lodged processing time can take between 8-12 weeks. It should be noted that there will be an application fee levied by the EES for the processing of AHIPs, which is dependent on the estimated total cost of the development project. Where there are multiple sites within one study area an application for an AHIP to cover the entire study area is recommended.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the EES. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying the EES and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and EES's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by EES.

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Appendices

Appendix 1 Consultation log

Stage 1 – Notification of project proposal and registration of interest

Step 1: Identification of Aboriginal people/parties with an interest in the proposed study area

Organisation contacted	Date and type of contact	Date and type of response	Response details
Wollongong City Council (WCC)	22/8/2019 – Email	22/8/2019 – Email	Received notification
EES	22/8/2019 – Email	25/7/2019 – Email	Provided list of Aboriginal stakeholders
NSW Native Title Services Corporation Limited (NTSCORP Limited)	22/8/2019 – Email	30/8/2019 – Email	Requested further information of the work involved such as surveying the study area and monitoring during construction works.
Office of the Registrar, Aboriginal Land Rights Act 1983 of Aboriginal Owners	22/8/2019 – Email	14/10/2019 – Email	Indicated there were no Aboriginal owners and to contact ILALC
National Native Title Tribunal (NNTT)	22/8/2019 – Email	N/A	
South East Local Land Services	22/8/2019 – Email	23/8/2019 – Email	Recommended to contact OEH
Illawarra Local Aboriginal Land Council (ILALC)	22/8/2019 – Email	26/8/2019 – Email	Registered an interest

Step 2: Public advertisement

The public notice was published in the *Illawarra Mercury* on the 24 August 2019. A copy of the advertisement is provided in Appendix 2.

Step 3: Registration of interest

The registration period ran from the 24 August to the 13 September 2019. Leeway was given to Aboriginal parties/groups who provided responses shortly after the close of this period and they have been registered as Aboriginal parties for consultation.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Badu (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Barraby Cultural Services	30/8/2019 – Email	1/9/2019 – Email	Registered interest
Bellambi Indigenous Corporation Gandangara Traditional Owners	30/8/2019 – Email	N/A	N/A
Biamanga (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A

Organisation contacted	Date and type of contact	Date and type of response	Response details
Bilinga (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Darryl Caines	30/8/2019 – Email	N/A	N/A
Gary Caines	30/8/2019 – Email	N/A	N/A
Coomaditchie United Aboriginal Corporation	30/8/2019 – Email	N/A	N/A
Cullendulla (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Darug Land Observations	30/8/2019 – Email	N/A	N/A
James Davis	30/8/2019 – Email	29/8/2019 – Email	Registered interest
Dharug (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Duncan Falk Consultancy	30/8/2019 – Email	1/9/2019 – Email	Registered interest
Ken Foster	30/8/2019 – Email	N/A	N/A
Gadhu Dreaming	30/8/2019 – Email	N/A	N/A
Raymond Garbutt	30/8/2019 – Email	N/A	N/A
Garrara Aboriginal Corporation	30/8/2019 – Email	N/A	N/A
Goobah Development PTY LTD (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Gumaraa	30/8/2019 – Email	30/8/2019 – Email	Registered interest
Gundungurra Tribal Technical Services	30/8/2019 – Email	N/A	N/A
Gunyuu (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Guunamaa Dreaming Sites and Surveying	30/8/2019 – Email	30/8/2019 – Email	Registered interest
Illawarra Aboriginal Corporation	30/8/2019 – Email	N/A	N/A
Illawarra Local Aboriginal Land Council	30/8/2019 – Email	30/8/2019 – Email	Registered interest
Gundungurra Tribal Technical Services	30/8/2019 – Email	N/A	N/A
Gundungurra Tribal Technical Services	30/8/2019 – Email	N/A	N/A
Jerringong (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Karrial (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Korewal Elouera Jerrungurah Tribal Elders Council	30/8/2019 – Email	N/A	N/A
Kullila Site Consultants and Koori Site Management	30/8/2019 – Email	N/A	N/A
La Perouse Botany Bay Corporation	30/8/2019 – Email	N/A	N/A
Shaun Carroll	N/A	12/9/2019 – Email	Registered interest

Organisation contacted	Date and type of contact	Date and type of response	Response details
Minnamunnung	30/8/2019 – Email	N/A	N/A
Munyunga (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Mura Indigenous Corporation (icn:8991)	30/8/2019 – Email	N/A	N/A
Muragadi	N/A	2/9/2019 – Email	Registered interest
Murramarang (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Murra Bidgee Mullangari Aboriginal Corporation	30/8/2019 – Email	2/9/2019 – Email	Registered interest
Murrumbul (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
NIAC	30/8/2019 – Email	N/A	N/A
Nundagurri (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Paul McLeod	N/A	2/9/2019 – Email	Registered interest
Pemulwuy (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Norma Simms	30/8/2019 – Email	N/A	N/A
South West Rocks Corporation	30/8/2019 – Email	N/A	N/A
Three Ducks Dreaming Surveying and Consulting	30/8/2019 – Email	N/A	N/A
Thoorga Nura	30/8/2019 – Email	N/A	N/A
Tungai Tonghi	30/8/2019 – Email	3/9/2019 – Phone	Registered interest
Leanne Tungai	30/8/2019 – Email	3/9/2019 – Email	Registered interest
The Wadi Wadi Coomaditchie Aboriginal Corporation	30/8/2019 – Email	N/A	N/A
The Wadi Wadi Coomaditchie Aboriginal Corporation (correspondence via NIAC)	30/8/2019 – Email	N/A	N/A
Walbunja (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Walgalu (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Warra Bingi Nunda Gurri	30/8/2019 – Email	30/8/2019 – Email	Registered interest
The Wodi Wodi Elders Corporation	30/8/2019 – Email	N/A	N/A
Woronora Plateau Gundungara Elders Council	30/8/2019 – Email	26/8/2019 – Email	Registered interest
Wullung (Murrin Clan/Peoples)	30/8/2019 – Email	N/A	N/A
Yerramurra (Murrin Clan/Peoples)	30/8/2019 – Email	30/8/2019 – Email	Registered interest
Yulay Cultural Services	N/A	1/9/2019 – Email	Registered interest

Organisation contacted	Date and type of contact	Date and type of response	Response details
Yurrandaali Cultural Services	30/8/2019 – Email	1/9/2019 – Email	Registered interest
South Coast Peoples	30/8/2019 – Email	3/9/2019 – Email	Registered interest

Stage 2 – Presentation of information about the proposed project

Step 1: Provision of project information pack

A copy of the information pack is provided in Appendix 3 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Barraby Cultural Services	17/9/2019 – Email	24/9/2019 – Email	Agrees with the methodology
James Davis	17/9/2019 – Email	N/A	N/A
Duncan Falk Consultancy	17/9/2019 – Email	N/A	N/A
Gumaraa	17/9/2019 – Email	N/A	N/A
Guunamaa Dreaming Sites and Surveying	17/9/2019 – Email	N/A	N/A
Illawarra Local Aboriginal Land Council	17/9/2019 – Email	N/A	N/A
Shaun Carroll	17/9/2019 – Email	8/10/2019 – Email	Agrees with the methodology
Muragadi	17/9/2019 – Email	8/10/2019 – Email	Agrees with the methodology
Murra Bidgee Mullangari Aboriginal Corporation	17/9/2019 – Email	25/9/2019 – Email	Agrees with the methodology
Paul McLeod	17/9/2019 – Email	N/A	N/A
Tungai Tonghi	17/9/2019 – Email	N/A	N/A
Leanne Tungai	17/9/2019 – Email	N/A	Received methodology
Warra Bingi Nunda Gurri	17/9/2019 – Email	N/A	N/A
Woronora Plateau Gundungara Elders Council	17/9/2019 – Email	N/A	N/A
Yerramurra (Murrin Clan/Peoples)	17/9/2019 – Email	N/A	N/A
Yulay Cultural Services	17/9/2019 – Email	24/9/2019 – Email	Agrees with the methodology
Yurrandaali Cultural Services	17/9/2019 – Email	24/9/2019 – Email	Agrees with the methodology
South Coast Peoples	17/9/2019 – Email	N/A	N/A

Stage 3 – Gathering information about cultural significance

Step 1: Provision of project methodology pack and consultation meeting

A copy of the methodology pack is provided in Appendix 3 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Barraby Cultural Services	17/9/2019 – Email	24/9/2019 – Email	Agrees with the methodology
James Davis	17/9/2019 – Email	N/A	N/A
Duncan Falk Consultancy	17/9/2019 – Email	N/A	N/A
Gumaraa	17/9/2019 – Email	N/A	N/A
Guunamaa Dreaming Sites and Surveying	17/9/2019 – Email	N/A	N/A
Illawarra Local Aboriginal Land Council	17/9/2019 – Email	N/A	N/A
Shaun Carroll	17/9/2019 – Email	8/10/2019 – Email	Agrees with the methodology
Muragadi	17/9/2019 – Email	8/10/2019 – Email	Agrees with the methodology
Murra Bidgee Mullangari Aboriginal Corporation	17/9/2019 – Email	25/9/2019 – Email	Agrees with the methodology
Paul McLeod	17/9/2019 – Email	N/A	N/A
Tungai Tonghi	17/9/2019 – Email	N/A	N/A
Leanne Tungai	17/9/2019 – Email	N/A	Received methodology
Warra Bingi Nunda Gurri	17/9/2019 – Email	N/A	N/A
Woronora Plateau Gundungara Elders Council	17/9/2019 – Email	N/A	N/A
Yerramurra (Murrin Clan/Peoples)	17/9/2019 – Email	N/A	N/A
Yulay Cultural Services	17/9/2019 – Email	24/9/2019 – Email	Agrees with the methodology
Yurrandaali Cultural Services	17/9/2019 – Email	24/9/2019 – Email	Agrees with the methodology
South Coast Peoples	17/9/2019 – Email	N/A	N/A

Stage 4 – Review of Draft Aboriginal Cultural Heritage Assessment

Step 1: Provision of draft report for review *(to be completed following 28 day review period)*

Organisation contacted	Date and type of contact	Date and type of response	Response details

Appendix 2 Stage 1: Notification of project proposal and registration of interest

Appendix 3 Stage 2: Presentation of information about the proposed project and Stage 3: Gathering information about cultural significance

Appendix 4 Stage 4: Review of draft cultural heritage assessment report

Appendix 5 Archaeological report

Appendix 6 Previous consultation log

Stage 1 – Notification of project proposal and registration of interest

Step 1: Identification of Aboriginal people/parties with an interest in the proposed study area

Organisation contacted	Date and type of contact	Date and type of response	Response details
Wollongong City Council (WCC)	15/06/2017 - Letter	29/06/2017 - email	Encouraged to refer to OEH List
NSW Office of Environment and Water (OEH)	15/06/2017 - Letter	26/08/2017 - email	Provided list of Aboriginal stakeholders
NSW Native Title Services Corporation Limited (NTSCORP Limited)	15/06/2017 - Letter	N/A	
Office of the Registrar, Aboriginal Land Rights Act 1983 of Aboriginal Owners	15/06/2017 - Letter	26/08/2017 - email	Indicated there were no Aboriginal owners and to contact ILALC
National Native Title Tribunal (NNTT)	15/06/2017 - Letter	N/A	
South East Local Land Services	15/06/2017 - Letter	23/06/2017- letter	Recommended to contact OEH
Illawarra Local Aboriginal Land Council (ILALC)	15/06/2017 - Letter	N/A	

Step 2: Public advertisement

The public notice was published in the *Illawarra Mercury* on the 20 June 2017. A copy of the advertisement is provided in Appendix 2.

Step 3: Registration of interest

The registration period ran from the 27 June 2017 to the 11 June 2017. Leeway was given to Aboriginal parties/groups who provided responses shortly after the close of this period and they have been registered as Aboriginal parties for consultation.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Badu (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Bellambi Indigenous Corporation Gandangarra Traditional Owners	27/06/2017 - email	N/A	N/A
Biamanga (Murrin Clan/Peoples)	27/06/2017 - email	10/07/2017 - email	Registered interest

Organisation contacted	Date and type of contact	Date and type of response	Response details
Bilinga (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Bilinga Cultural Heritage Technical Services (Mirramajah)	27/06/2017 - email	N/A	N/A
Coomaditchie United Aboriginal Corporation	27/06/2017 - email	N/A	N/A
Cullendulla (Murrin Clan/Peoples)	27/06/2017 - email	10/07/2017 - email	Registered interest
Darug Land Observations	27/06/2017 - email	21/06/2017 - email	Registered interest
Dharug (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Duncan Falk Consultancy	27/06/2017 - email	10/07/2017 - email	Registered interest
Gadhu Dreaming	27/06/2017 - email	N/A	N/A
Garrara Aboriginal Corporation	27/06/2017 - email	N/A	N/A
Goobah Development Pty Ltd (Murrin Clan/Peoples)	27/06/2017 - email	10/07/2017 - email	Registered interest
Gundungurra Tribal Technical Services	27/06/2017 - email	N/A	N/A
Gunyuu (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Gunyuu Cultural Heritage Technical Services (Mirramajah)	27/06/2017 - email	N/A	N/A
Guunamaa Dreaming Sites and Surveying	27/06/2017 - letter	27/06/2017 - email	Registered interest
Illawarra Aboriginal Corporation	27/06/2017 - email	N/A	N/A
Illawarra Local Aboriginal Land Council	27/06/2017 - email	N/A	N/A
Jerringong (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Karrial (Murrin Clan/Peoples)	27/06/2017 - letter	N/A	N/A
Korewal Elouera Jerrungurah Tribal Elders Council	27/06/2017 - letter	N/A	N/A
Kulila Site Consultants & Koori Site Management	27/06/2017 - letter	N/A	N/A
La Perouse Botany Bay Corporation	27/06/2017 - email	N/A	N/A

Organisation contacted	Date and type of contact	Date and type of response	Response details
Minnamunnung	27/06/2017 - email	10/07/2017 - email	Registered interest
Munyunga (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Munyunga Cultural Heritage Technical Services (Mirramajah)	27/06/2017 - email	N/A	N/A
Murramarang (Murrin Clan/Peoples)	27/06/2017 - email	10/07/2017 - email	Registered interest
Murrumbul (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Murrumbul Cultural Heritage Technical Services (Mirramajah)	27/06/2017 - letter	N/A	N/A
NIAC	27/06/2017 - email	N/A	N/A
Nundagurri (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Pemulwuy (Murrin Clan/Peoples)	27/06/2017 - letter	N/A	N/A
South West Rocks Corporation	27/06/2017 - letter	N/A	N/A
The Wodi Wodi Elders Corporation	27/06/2017 - email	N/A	N/A
Three Ducks Dreaming Surveying and Consulting	27/06/2017 - email	27/06/2017 - email	Registered interest
Walbunja (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Walgalu (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Warra Bingi Nunda Gurri	27/06/2017 - email	21/06/2017 - email	Registered interest
Wingikara Cultural Heritage Technical Services (Mirramajah)	27/06/2017 - email	N/A	N/A
Gary Caines	27/06/2017 - email	N/A	N/A
James Davis	27/06/2017 - letter	30/06/2017 - email	Registered interest
Ken Foster	27/06/2017 - letter	N/A	N/A
Norman Simms	27/06/2017 - email	N/A	N/A

Organisation contacted	Date and type of contact	Date and type of response	Response details
Woronora Plateau Gundungara Elders Council	27/06/2017 - email	27/06/2017 - email	Registered interest
Wullung (Murrin Clan/Peoples)	27/06/2017 - email	N/A	N/A
Yerramurra (Murrin Clan/Peoples)	27/06/2017 - letter	N/A	N/A
The Wadi Wadi Coomaditchie Aboriginal Corporation	27/06/2017 - email	28/06/2017 - verbal	Registered interest
Tungai Tonghi	27/06/2017 - email	N/A	N/A

Stage 2 – Presentation of information about the proposed project

Step 1: Provision of project information pack

A copy of the information pack is provided in Appendix 3 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Biamanga (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 – email	Confirmed support for proposed draft ACHA methodology; requested that any artefacts found are given to the Illawarra Local Aboriginal Land Council for future educational design projects.
Cullendulla (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 – email	Confirmed support for the ACHA report.
Darug Land Observations	22/09/2017 – Email	29/09/2017 – email	Jamie Workman contacted Biosis on behalf of Darug Land Observations in response to the methodology. Darug Land Observation Pty Ltd supports the methodology, and wishes to be involved in the monitoring of the topsoil removal, test excavations, and any other works to be carried out.
Duncan Falk Consultancy	22/09/2017 – Email	N/A	
Goobah Development Pty Ltd (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 - email	Confirmed support for proposed draft ACHA methodology, wishes to be kept informed of any further developments.
Guunamaa Dreaming Sites and Surveying	22/09/2017 – Email	N/A	
Illawarra Local Aboriginal Land Council	22/09/2017 – Email	N/A	

Organisation contacted	Date and type of contact	Date and type of response	Response details
Individual	22/09/2017 – Email	N/A	
Minnamunnung	22/09/2017 – Email	N/A	
Murramarang (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 - email	Confirmed support for proposed draft ACHA methodology, wishes to be kept informed of any further developments.
The Wadi Wadi Coomaditchie Aboriginal Corporation	22/09/2017 – Post	N/A	
Three Ducks Dreaming Surveying and Consulting	22/09/2017 – Email	22/09/2017 - email	Confirmed support for proposed draft ACHA methodology; requested that any artefacts found are given to the Illawarra Local Aboriginal Land Council for future educational design projects.
Warra Bingi Nunda Gurri	22/09/2017 – Email	N/A	
Woronora Plateau Gundangara Elders	22/09/2017 – Email	N/A	

Stage 3 – Gathering information about cultural significance

Step 1: Provision of project methodology pack and consultation meeting

A copy of the methodology pack is provided in Appendix 3 and a copy of the covering email is provided following.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Biamanga (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 – email	Confirmed support for proposed draft ACHA methodology; requested that any artefacts found are given to the Illawarra Local Aboriginal Land Council for future educational design projects.
Cullendulla (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 – email	Confirmed support for the ACHA report.
Darug Land Observations	22/09/2017 – Email	29/09/2017 – email	Jamie Workman contacted Biosis on behalf of Darug Land Observations in response to the methodology. Darug Land Observation Pty Ltd supports the methodology, and wishes to be involved in the monitoring of the topsoil removal, test excavations, and any other works to be carried out.
Duncan Falk Consultancy	22/09/2017 –	N/A	

Organisation contacted	Date and type of contact	Date and type of response	Response details
	Email		
Goobah Development Pty Ltd (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 - email	Confirmed support for proposed draft ACHA methodology, wishes to be kept informed of any further developments.
Guunamaa Dreaming Sites and Surveying	22/09/2017 – Email	N/A	
Illawarra Local Aboriginal Land Council	22/09/2017 – Email	N/A	
James Davis (individual)	22/09/2017 – Email	N/A	
Minnamunnung	22/09/2017 – Email	N/A	
Murramarang (Murrin Clan/Peoples)	22/09/2017 – Email	19/10/2017 - email	Confirmed support for proposed draft ACHA methodology, wishes to be kept informed of any further developments.
The Wadi Wadi Coomaditchie Aboriginal Corporation	22/09/2017 – Letter	N/A	
Three Ducks Dreaming Surveying and Consulting	22/09/2017 – Email	22/09/2017 - email	Confirmed support for proposed draft ACHA methodology; requested that any artefacts found are given to the Illawarra Local Aboriginal Land Council for future educational design projects.
Warra Bingi Nunda Gurri	22/09/2017 – Email	N/A	
Woronora Plateau Gundangara Elders	22/09/2017 – Email	N/A	

Stage 4 – Review of Draft Aboriginal Cultural Heritage Assessment

A copy of the correspondence relevant to this stage of consultation is available in Appendix 4.

Organisation contacted	Date and type of contact	Date and type of response	Response details
Biamanga (Murrin Clan/Peoples)	02/11/2017 - Email	28/11/2017 - Email	Confirmed support for draft ACHA and AR.
Cullendulla (Murrin Clan/Peoples)	02/11/2017 - Email	28/11/2017 - Email	Confirmed support for draft ACHA and AR.
Darug Land Observations	02/11/2017 - Email	N/A	

Organisation contacted	Date and type of contact	Date and type of response	Response details
Duncan Falk Consultancy	02/11/2017 - Email	28/11/2017 - Email	Confirmed support for draft ACHA and AR; recommended that any artefacts found are reburied in an agreed location where they will not be impacted upon in the future. Confirmed that Duncan Falk Consultancy holds evidence regarding language boundaries, noting that Dharawal ranged from the Illawarra to Bong Bong now known as the Southern Highlands and surrounding areas.
Goobah Development Pty Ltd (Murrin Clan/Peoples)	02/11/2017 - Email	28/11/2017 - Email	Confirmed support for draft ACHA and AR; wishes to be kept informed of any further developments.
Guunamaa Dreaming Sites and Surveying	02/11/2017 - Email	06/11/2017 – Email	Confirmed support for draft ACHA and AR; request for Aboriginal groups from Illawarra only to be involved.
Illawarra Local Aboriginal Land Council (ILALC)	02/11/2017 - Email	N/A	
Minnamunnung	02/11/2017 - Email	N/A	
Murramarang (Murrin Clan/Peoples)	02/11/2017 - Email	28/11/2017 - Email	Confirmed support for draft ACHA and AR.
The Wadi Wadi Coomaditchie Aboriginal Corporation	02/11/2017 - Letter	N/A	
Three Ducks Dreaming Surveying and Consulting	02/11/2017 - Email	06/11/2017 - Email	Confirmed support for draft ACHA and AR; believes there are many significant areas within the area, especially around the creeks and plains.
Warra Bingi Nunda Gurri	02/11/2017 - Email	N/A	
Woronora Plateau Gundangara Elders Council	02/11/2017 - Email	N/A	
James Davis (individual)	02/11/2017 - Email	N/A	

Tallawarra Lands North Precinct: Archaeological report

FINAL REPORT

Prepared for Cardno on behalf of Bridgehill Group

3 October 2019

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Draft 01	Amanda Markham	21/10/2019	Biosis
Final 01	TBA	TBA	Biosis

Acknowledgements

Biosis gratefully acknowledges the contributions of the following people and organisations in preparing this report:

Registered Aboriginal Parties

- Illawarra Local Aboriginal Land Council (ILALC)
- Warra Bingi Nunda Gurri
- Woronora Plateau Gundangara Elders Council
- Guunamaa Dreaming and Sites Surveying
- James Davis
- Duncan Falk Consultancy
- Gumaraa
- Yerramurra (Murrin Clan/Peoples)
- Barraby Cultural Services
- Yurrandaali Cultural Services
- Yulay Cultural Services
- Paul James McLeod
- Murra Bidgee Mullangari Aboriginal Corporation
- Muragadi
- Leanne Tungai
- South Coast Peoples
- Tungai Tonghi
- Shaun Carroll

Government Departments

- Environment, Energy and Science group (EES, formerly OEH)
- National Native Title Tribunal (NNTT)
- Wollongong City Council (WCC)
- South East Local Land Services (LLS)
- Office of the Registrar Aboriginal Land Rights Act

Client

- Cardno on behalf of Bridgehill Group

Biosis

- Sonika Kumar, Lauren Harley and Lucy Wilson for mapping

Contents

Tables

Figures

Plates

Glossary

ACHA	Aboriginal cultural heritage assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
Consultation requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*
CBD	Central Business District
DA	Determining Authority
DECCW	Department of Environment, Climate Change and Water
DP	Deposited Plan
EES	Environment, Energy and Science Group (formerly OEH)
EP&A Act	*Environmental Planning and Assessment Act 1979*
GDA	Geocentric Datum of Australia
GPS	Global Positioning System
GSV	Ground Surface Visibility
ILALC	Illawarra Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
MGA	Map Grid of Australia
NPW Act	National Parks and Wildlife Act
NPWS	National Parks and Wildlife Service
NSW	New South Wales
NTSCORP	Native Title Services Corporation
OEH	NSW Office of Environment and Heritage (now EES)
PAD	Potential Archaeological Deposit
Study area	Defined as Lot 30 DP 1175058 and part Lot 31 DP 1175058
RAP	Registered Aboriginal Party
The code	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010)

Summary

Biosis Pty Ltd was commissioned by Cardno on behalf of Bridgehill Group to undertake an Aboriginal cultural heritage assessment (ACHA) and archaeological report (AR) (this report) of a proposed development at Tallawarra (Northern Precinct), Yallah New South Wales (NSW). Bridgehill Group have acquired some of the Tallawarra Lands in the Northern and Central Precincts from Energy Australia, and intend to develop new residential communities on those lands.

Cardno on behalf of Bridgehill Group intends to lodge a development application for the proposed electrical transmission relocation in the Northern Precinct and to modify the existing concept approval for the Northern and Central Precincts (MP 09_0131 MOD 1). Wollongong City Council is the Determining Authority (DA) and will assess the application to help them determine if the proposed development is likely to have a significant effect on the environment, including Aboriginal cultural heritage. The boundary of the study area has been modified since the previous assessment undertaken by Biosis (2017) to include this electrical easement. An assessment in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010a) (the Code) has been undertaken for this additional area and is included in Appendix 7 of the ACHA.

This AR covers the Northern Precinct (the study area), and aims to determine whether the proposed modification will have any additional impacts on Aboriginal cultural values. The study area is located within the Tallawarra North Precinct, Yallah NSW. It encompasses Lot 30 DP 1175058 and part Lot 31 DP 1175058, and is approximately 12 kilometres south west of Wollongong CBD. It encompasses 45.06 hectares of private land and the adjacent road reserves.

This report has responded to Section 6.10.1 Aboriginal Cultural Heritage of the *Tallawarra Lands, Yallah: Request for Secretary's Environmental Assessment Requirements* (Urbis 2016) to:

- Confirm the location of archaeological sites relative to the proposed expanded areas.
- Consultation with relevant stakeholders prior to preparation of the EIS.
- Identify the nature and extent of impacts on Aboriginal and cultural heritage values across the project area; and
- Provide the actions that will be taken to avoid or mitigate impacts of the project or Aboriginal cultural heritage values.

SEARs Item	Response
12. Aboriginal Cultural Heritage **Aboriginal Cultural Heritage Assessment in accordance with *the Guide to investigating Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011) and *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW)**	This report has been conducted in accordance with the *Guide to Investigating Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW 2011). This report supports the Aboriginal cultural heritage assessment, which has been conducted in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW). Consultation with Registered Aboriginal Parties is currently underway.

There are 107 Aboriginal cultural heritage sites registered with the Aboriginal Heritage Information Management System (AHIMS) register in a three square kilometre area around the study area. Two AHIMS sites are located within the study area Boomberry Point 1 (AHIMS 52-5-0223) and Elizabeth Point (AHIMS 52-5-0225). Two AHIMS sites are located within 10 metres of the study area Gilba Road 1 (52-5-0642) and Gilba Road 2 Fill 1 (AHIMS 52-5-0643).

An archaeological survey was conducted on 29 June 2017. The overall effectiveness of the survey for examining the ground for Aboriginal sites was deemed low. This was attributed to vegetation cover restricting ground surface visibility combined with a low amount of exposures. No previously unrecorded Aboriginal cultural heritage sites were identified during the field survey. One area of moderate archaeological sensitivity was identified. There is potential for development activities to impact Aboriginal sites and the area of archaeological sensitivity.

This assessment has concluded that the proposed modification and subsequent development will not have any impacts on additional AHIMS sites or areas of archaeological potential.

Strategies have been developed based on the archaeological significance of cultural heritage relevant to the study area. The strategies also take into consideration:

- Predicted impacts to Aboriginal cultural heritage
- The planning approvals framework
- Current best conservation practice, widely considered to include:
  - Ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter
  - The Code.

The recommendations that resulted from the consultation process are provided below.

Management recommendations

Prior to any development impacts occurring within the study area, the following is recommended:

Recommendation 1: Application for an Aboriginal Heritage Impact Permit (AHIP) to conduct test excavations

Under Requirement 14 of the code, test excavations within 50 metres of known or suspected shell midden sites are not permitted without an AHIP. Due to the presence of AHIMS 52-5-0223 (Boomberry Point 1) within the study area and the proximity of one possible midden, AHIMS 52-5-0643 (Gilba Road 2 Fill 1), it will be necessary to apply for an AHIP to conduct test excavations.

For information about AHIPs and their preparation, see below.

Advice preparing AHIPs

An AHIP is required for any activities likely to have an impact on Aboriginal objects or Places or cause land to be disturbed for the purposes of discovering an Aboriginal object. The Department of Environment, Energy and Science (EES) issues AHIPs under Part 6 of the *National Parks and Wildlife Act 1974* (NPW Act).

AHIPs should be prepared by a qualified archaeologist and lodged with the EES. Once the application is lodged processing time can take between 8-12 weeks. It should be noted that there will be an application fee levied by the EES for the processing of AHIPs, which is dependent on the estimated total cost of the development project. Where there are multiple sites within one study area an application for an AHIP to cover the entire study area is recommended.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the EES. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying the EES and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and EES's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by EES.

1 Introduction

1.1 Project background

Biosis Pty Ltd was commissioned by Cardno on behalf of Bridgehill Group to undertake an Aboriginal archaeological investigation for the proposed Northern Precinct at Tallawarra, Yallah NSW. The purpose of this assessment is to support a development application for the proposed electrical transmission relocation in the Northern Precinct and to modify the existing concept approval for the Northern Precinct (MP 09_0131 MOD 1) to allow an increased residential lot yield.

A previous Aboriginal archaeological assessment for the Tallawarra Lands Part 3A Concept Plan (MP 09_0131) was conducted by Biosis in 2010. The previous assessment consisted of an Aboriginal archaeological survey, Aboriginal Community consultation, and Aboriginal archaeological test excavations (Biosis Research 2010). An impact assessment conducted as part of the 2010 assessment concluded that two Aboriginal archaeological sites, Boomberry Point 1 (AHIMS 52-5-0223) and Elizabeth Point (AHIMS 52-5-0225), would be impacted on by the proposed development. Both Boomberry Point 1 and Elizabeth Point were assessed as having moderate archaeological significance.

This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with the Code. The Code has been developed to support the process of investigating and assessing Aboriginal cultural heritage by specifying the minimum standards for archaeological investigation undertaken in NSW under the NPW Act. The archaeological investigation must be undertaken in accordance with the requirements of the code.

It is stated in section 1.2 of the Code that where the Aboriginal cultural heritage assessment concludes that the proposed activity will result in harm to Aboriginal objects or declared Aboriginal Places, an application for an Aboriginal Heritage Impact Permit (AHIP) will be required. This application must be supported by an ACHAR and AR).

The *Environmental Planning and Assessment Act 1979* (EP&A Act) includes provisions for local government authorities to consider environmental impacts in land-use planning and decision making. Each Local Government Area (LGA) is required to create and maintain an Local Environmental Plan (LEP) that includes Aboriginal and historical heritage items. Local Councils identify items that are of significance within their LGA, and these items are listed on heritage schedules in the local LEP and are protected under the EP&A Act and *Heritage Act 1977.*

1.2 Study area

The study area is located within the Tallawarra North Precinct, Yallah NSW. It encompasses Lot 30 DP 1175058 and part Lot 31 DP 1175058, and is approximately 12 kilometres south west of Wollongong CBD (Figure 1). The study area contains 45.06 hectares of private land and the adjacent road reserves (Figure 2).

The study area is within the:

- Wollongong LGA.
- Parish of Calderwood.
- County of Camden.

The study area is bounded by Lake Illawarra to the east, the suburb of Koonawarra to the north, Energy Australia Tallawarra Power Station to the south, and rural land to the west.

1.3 Planning approvals

The proposed modification will be assessed against Part 3A section 75W of the EP&A Act. The DA will be assessed under Part 4 of the EP&A Act.

Other relevant legislation and planning instruments that will inform this assessment include:

- Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999.*
- NPW Act.
- NSW *National Parks and Wildlife Amendment Act 2010.*
- Infrastructure State Environmental Planning Policy 2007.
- Wollongong Development Control Plan 2009.

1.4 Objectives of the investigation

The purpose of this assessment is to determine if the proposed modification will impact on any additional areas of archaeological sensitivity or Aboriginal sites or objects.

The objectives of the investigation can be summarised as follows:

- To conduct additional background research in order to recognise any identifiable trends in site distribution and location.
- To search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the study area.
- To highlight environmental information considered relevant to past Aboriginal occupation of the locality and associated land use and the identification and integrity/preservation of Aboriginal sites.
- To summarise past Aboriginal occupation in the locality of the study area using ethnohistory and the archaeological record.
- To formulate a model to broadly predict the type and character of Aboriginal sites likely to exist throughout the study area, their location, frequency and integrity.
- To conduct a field survey of the study area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential of the study area.
- To assess the significance of any known Aboriginal sites in consultation with the Aboriginal community.
- To identify the impacts of the proposed development on any known or potential Aboriginal sites within the study area.
- To recommend strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

1.5 Investigators and contributors

The roles, previous experience and qualifications of the Biosis project team involved in the preparation of this archaeological report are described below in Table 1.

Table 1 Investigators and contributors

Name and qualifications	Experience summary	Project role
Taryn Gooley BA /Sci (Hons) Archaeology	Taryn is a consultant archaeologist with seven years of experience across south eastern NSW and Western Australia. Taryn has a particular interest in Aboriginal archaeology of North Western NSW, and the Hunter Valley and Newcastle regions. Taryn has experience in the successful completion of Aboriginal Cultural Heritage assessments, archaeological surveys, test excavations, and salvage excavations, as well as Aboriginal community consultation. She is also accomplished in obtaining approvals under the NSW National Parks and Wildlife Act 1974.	• Project director • Quality assurance
Samantha Keats BA (Hons)	Samantha is a consultant archaeologist with Biosis Wollongong office. Samantha has over three years of experience as an archaeologist, with a particular research focus on rock art assemblages and ochre in the north-west Kimberley region of Australia. Samantha has experience in conducting desktop assessments, archaeological survey and Aboriginal and historical excavation as well as consulting with Traditional Owners. She has experience in the successful completion of Aboriginal Cultural Heritage assessments, archaeological surveys, test excavations, and salvage excavations, as well as Aboriginal community consultation. She is also accomplished in obtaining approvals under the NSW National Parks and Wildlife Act 1974.	• Project manager • Report writing • Background research • Aboriginal groups consultation
Mathew Smith BA/BSc (Hons) Archaeology	Mathew is a field archaeologist with Biosis Wollongong office. Mathew has over one year of experience as an archaeologist, and specialises in lithics analysis. In addition to this, Mathew has well developed skills in archaeological survey and test excavation, as well as Aboriginal community consultation and background research.	• Lithics analysis • Report writing

Figure 1 Location of the study area - Tallawarra North Precinct

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping\

0 250 500 750 1,000
Metres
N
Scale 1:25,000 @ A4, GDA 1994 NSW Lambert

Biosis Pty Ltd
Albury, Ballarat, Melbourne, Newcastle, Sydney, Wangaratta & Wollongong

Legend

Study area

Figure 2 Study area detail

0 50 100 150 200

Metres
Scale: 1:4,000 @ A3
Coordinate System: GDA 1994 NSW Lambert

biosis

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_AR_F2_StudyArea

Acknowledgements: Basemap © Land and Property Information 2016

2 Proposed development

The development of the Northern Precinct will comprise residential, open space and associated civil works (Figure 3). The modification to the concept approval seeks to increase the footprint and residential yield for the Northern Precinct from 310 lots to 403 lots. Currently approved components of the concept plan for the Northern Precinct include:

- Approximately 403 residential lots (22.3 hectares)
- Environmental management areas in the vicinity of Mount Brown
- Open space areas on the foreshore of Lake Illawarra (87 hectares)
- The Northshore Precinct has existing vehicular access via Gilba Road.

The following amendments are proposed to the Concept Plan for the Northern Precinct:

- Reduce the existing transmission easement width to accommodate a 15 metre wide corridor for underground transmission lines beneath a proposed road
- Expand the R2 zone (for low density residential land) south east into the E1 Public Recreation lands
- Expand the R2 Zone (for low density residential use) south into the E3 Environmental Management up to the ridge
- The composition of lots has been altered from the Concept Plan, with a new indicative layout that includes lots down to 300m2 and 12.5 metres frontages, where suited to the topography of the site.

Legend

Study area

Proposed development

Figure 3 Proposed development

0 50 100 150 200

Metres

Scale: 1:4,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_AR_F3_PropDevelop

3 Desktop assessment

The desktop assessment involves researching and reviewing existing archaeological studies and reports relevant to the study area and Lake Illawarra region. This information is combined to develop an Aboriginal site prediction model for the study area, and to identify known Aboriginal sites and/or Places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

3.1 Landscape context

It is important to consider the local environment of the study area any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly landscape features can contribute to the cultural significance that places can have for people.

3.1.1 Geology, topography and hydrology

The Illawarra region forms part of the Sydney Basin; a geological basin filled with near horizontal sandstones and shales of Permian to Triassic age overlying older basement rocks of the Lachlan Fold Belt. The Illawarra subregion of the Sydney Basin is characterised by Permian siltstones, shale, sandstones and interbedded volcanics on and below the coastal escarpment. The geology of the region provides useful stone resources for toolmaking, included volcanic rocks useful for manufacture of edge ground axes. The study area is dominated by the Broughton Formation geological unit (Figure 4).

The study area is situated on the Coastal Plain on the edge of Lake Illawarra and the Escarpment (Figure 6). This physiographic unit has formed from the gradual recession westward of the Plateau (Bowman 1971). The Coastal Plain is characterised as a mosaic of foothills, ridges, spurs, hillocks and floodplains with slopes varying from very gently inclined to steep with the occasional low cliff. It is dissected by easterly flowing streams at intervals that become more frequent towards the north (Fuller 1982, p.18). The Coastal Plain is widest at the points where Macquarie Rivulet has entrenched into the Plateau at Macquarie Pass and where other waterways that provide the catchment area of Lake Illawarra, such as Duck and Wollingurry Creek systems, have carved into the Escarpment (Bowman 1971).

Situated on the western shore of Lake Illawarra, the study area extends from Koonawarra to Yallah bays (from north to south). Lake Illawarra was formed from the drowning of the Macquarie Rivulet valley during the raising of Holocene sea levels (6-7,000 years ago); the estuary was subsequently formed behind the large sand barrier that now forms the Windang Peninsula. Lake Illawarra is the largest estuarine lagoon on the South Coast of NSW, covering an area of 33 square kilometres and extending over nine kilometres in length and five kilometres in width. It receives salt water from the Pacific Ocean and fresh water from the Illawarra Escarpment (Roy 1984). Lake Illawarra is classified as an early Intermediate Barrier Estuary or an estuarine lagoon. Barrier estuaries are characterised by 'narrow elongated entrance channels with broad tidal and back barrier sand flats' (Roy 1984, p.5).

The proximity to Lake Illawarra would have provided abundant food resources and is likely to result in the presence of Aboriginal sites, such as middens, in the vicinity of the study area.

3.1.2 Climate

The climate within the study area is generally temperate with a maritime influence. Summers in the coastal regions are generally warm, while winters are mild. In the escarpment areas to the west, winters are cold. Moderate to high temperatures, high humidity, onshore winds and peak rainfall characterise summer and autumn (Hazelton 1992). One third of the mean annual rainfall occurs between January and March, with a secondary rainfall peak in June. Winter winds are predominantly westerly, producing drier, cooler conditions.

3.1.3 Soil landscapes

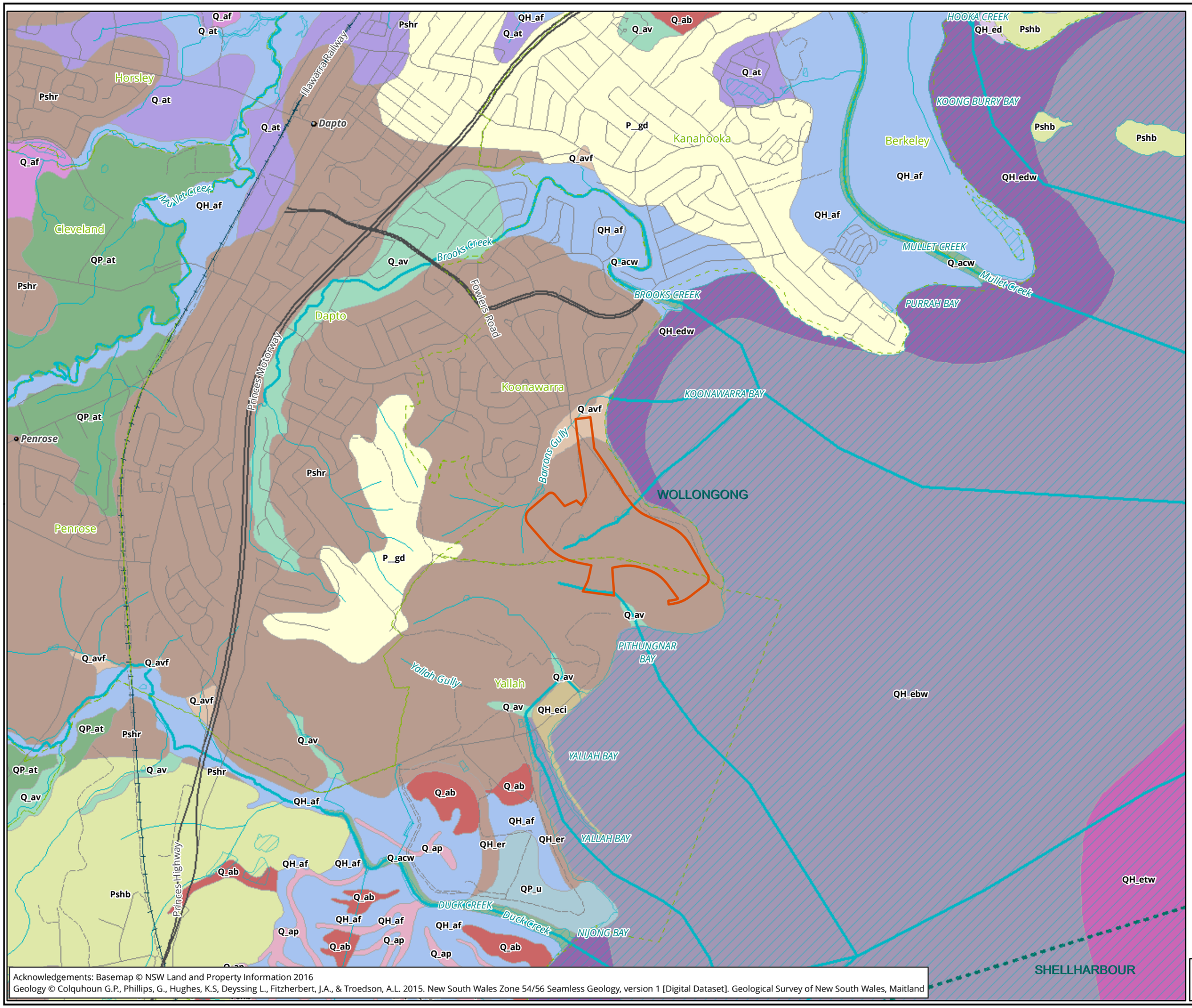
Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure. The study area contains one erosional soil landscape called the Shellharbour soil landscape (Figure 5). Erosional soil landscapes comprise soils that are derived from the erosive action of running water, primarily well-defined streams that have the ability to transport their sediment load. Soils may be either absent, derived from water-washed parent materials, or derived from *in situ* weathered bedrock.

The characteristics of the Shellharbour soil landscape are summarised in Table 2.

Table 2 Shellharbour soil landscape characteristics (Hazelton 1992, pp.58–60)

Soil landscape	Topography	Soils
Shellharbour	Rolling low hills with long side slopes and broad drainage lines. Relief 30-50 metres. Slopes <20% incline.	Crests and upper slopes: Hard setting black rich clays overlying <100 cm of brown strongly pedal heavy clay. Mid slopes: Up to 20 cm of brownish black sandy loam overlies <50 cm of strongly pedal reddish brown sandy clay. 50 cm of mottled reddish brown sandy clay overlies <50 cm of brown strongly pedal heavy clay. Foot slopes and drainage plains: Up to 40 cm of reddish brown sandy clay overlies >50 cm of strongly pedal brown heavy clay.

The Shellharbour soil landscape has a high to very high erodibility rating would therefore be susceptible to frequent soil movement. This would result in poor preservation of archaeological material at shallow depths but would potentially lead to exposures of any deeper archaeological deposits were topsoil has eroded away.



Legend

Study area

Geological units

- P__gd - Dapto Latite Member
- Pshb - Berry Siltstone
- Pshr - Broughton Formation
- Q_ab - Alluvial backswamp deposits
- Q_acw - Alluvial channel deposits-
- Q_af - Alluvial floodplain deposits
- Q_ap - Alluvial palaeochannel deposits
- Q_at - Alluvial terrace deposits
- Q_av - Alluvial valley deposits
- Q_avf - Alluvial fan deposits
- QH_af - Alluvial floodplain deposits
- QH_ebw - Estuarine basin and bay (subaqueous)
- QH_eci - Estuarine in-channel bar and beach deposits
- QH_ed - Estuarine- fluvial delta front
- QH_edw - Estuarine- fluvial delta front (subaqueous)
- QH_er - Estuarine shoreline ridge and dune
- QH_etw - Estuarine tidal delta flat (subaqueous)
- QP_at - Alluvial terrace deposits
- QP_u - Pleistocene undifferentiated regolith

Figure 4 Geology within the study area vicinity

0 200 400 600 800 1,000

Metres

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

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Albury, Ballarat, Melbourne,
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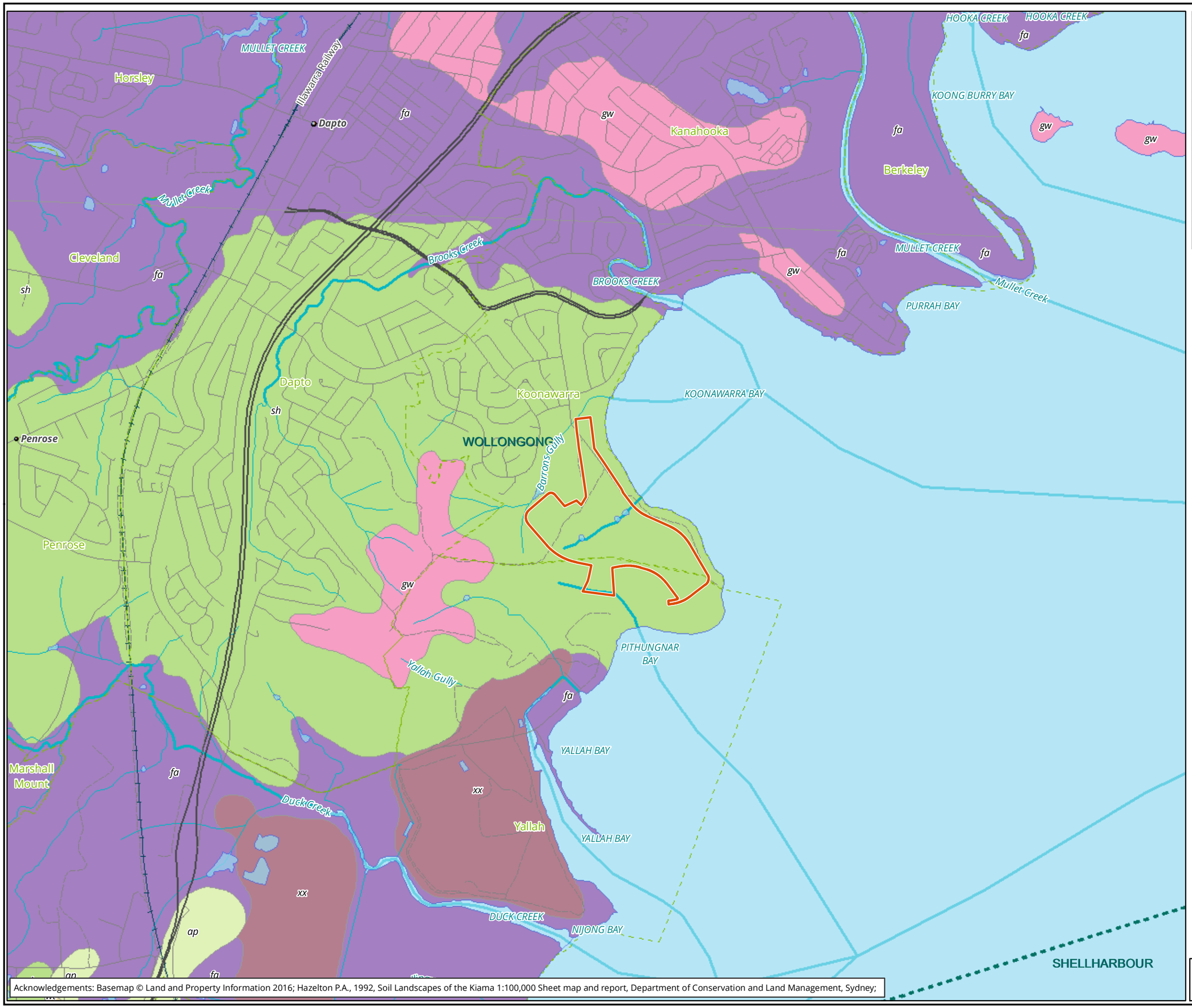
Matter: 30437,
Date: 11 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_AR_F4_Geology.mxd



Legend

Study area

Soil landscape units

- ap - ALBION PARK
- fa - FAIRY MEADOW
- gw - GWYNNEVILLE
- sh - SHELLHARBOUR
- wt - WATTAMOLLA ROAD
- xx - DISTURBED TERRAIN

Figure 5 Soil landscapes (1:100,000) within the study area

0 200 400 600 800 1,000

Metres
Scale: 1:20,000 @ A3
Coordinate System: GDA 1994 NSW Lambert

Acknowledgements: Basemap © Land and Property Information 2016; Hazelton P.A., 1992, Soil Landscapes of the Kiama 1:100,000 Sheet map and report, Department of Conservation and Land Management, Sydney;

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Date: 21 October 2019,
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Location:P:\30400s\30437\Mapping
30437_AR_F5_Soils

Legend

Study area

Landforms

Creekline

Crest

Hill slope

Figure 6 Landforms within the study area

0 50 100 150 200

Metres

Scale: 1:4,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

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30437_AR_F6_Landforms

Acknowledgements: Basemap © Land and Property Information 2016

3.1.4 Landscape resources

The Coastal Plain of the Illawarra region provides a number of resources used by Aboriginal inhabitants. The geology of the region provides an abundant supply of raw materials. Quartz is the main stone raw-material type suitable for Aboriginal tool manufacture that is likely to occur in the vicinity of the study area in any abundance. This would have been available locally and also from trading with other groups (Donlon & Sefton 1988, p.23). Igneous material would have come from the south of the study area in areas like Gerringong (Donlon & Sefton 1988, p.55) due to its volcanic nature. Some of the other fined grain siliceous material may have come from the Cumberland Plain. Silcrete cobbles are known to have occurred along the Cumberland Plain (McDonald 1992), to the north of the study area. Elsewhere on the Plain, the potential raw materials for stone artefact making include silicified wood, tuff, mudstone, quartz, quartzite and basalt. River gravels and cobbles containing silcrete, chert, and other fine grained volcanic rocks were also used (Attenbrow 2010). While previous archaeological work within the region has not identified any specific stone sources, the presence of the volcanic Dapto Latite Member in the region may have provided a suitable source of raw material, providing lithic material for stone axes. Resources would have been accessible in the outcrops of siltstone, shale and tuffaceous sandstones of the Berry Siltstone formation.

Aerial imagery and vegetation mapping undertaken by the National parks and Wildlife Service (NPWS) shows that the study are has been cleared of native vegetation; however, native vegetation communities in the vicinity of the study area and around Lake Illawarra would have been comparable to vegetation found in the study area prior to clearing. These vegetation communities include

- Lowland Woollybutt–Melaleuca Forest located on flat low-lying Shoalhaven Group sediments at elevations between 10 and 35 metres above sea level. It is characterised by the presence of Woolybutt (*Eucalyptus longifolia*), Stringybark (*E. globoidea/E. eugenioides*), and Honey Myrtle (*Melaleuca decora).*
- Coastal Swamp Oak Forest occurring in estuarine environment that include low-lying areas of coastal floodplain and the fringes of lakes and lagoons. Common and abundant species that occur include Swamp Oak (*Casuarina glauca*), Common Reed (*Phragmites australis*), and various sedges

A number of these plant species would have been used by Aboriginal groups to make various wooden implements. Wood from the Swamp Oak was used to make tools such as nulla nullas, while the bark was removed and made into canoe hulls (Robinson 1991, p.152).

Local Aboriginal groups would have had access to an abundant range of marine, terrestrial and avian species present in the coastal resource zone which would have provided a variety of uses. Marine animals such as cockles, lobster and periwinkles were eaten (Wesson 2009). Abalone and stingrays were also used to make fish hooks and tools in addition to their use as a food source (Wesson 2009). Terrestrial species on the coastal plain, such as kangaroos, possums and wombats would have been exploited for food and to make cloaks, and tools (Attenbrow 2010). Avian species were used as a food source, and in the case of the pelican and black duck were often totem animals for Aboriginal groups (Wesson 2009).

3.1.5 Land use history

Within the proposed study area, soil disturbance is associated with historic pastoral land-use practices and recreational usage. The entire area between Koonawarra and Yallah bays have been subjected to extensive grazing and agricultural practices from the 1880s onwards. As well as vegetation clearing for pasture and agriculture, other land disturbances within the property include construction of the high voltage transmission lines and towers; recreational usage resulting in impact trails particularly by trail bikes and pedestrian traffic in the low lying areas along the foreshore.

Although these past land activities caused disturbances, they may have impacted only the surface contexts of any existing Aboriginal archaeological site; it is unlikely that they would have destroyed sites. Clearing of the

land would have most likely removed any native culturally modified trees that were originally present in the study area.

3.2 Previous archaeological work

The majority of South Coast sites date to the last 6,000 years when the sea-level stabilised following the last ice age. Prior to this, sea-levels were lower and the coast-line was located approximately 14 kilometres to the east of its current position. Coastal sites older than 6,000 years are rare, as most would have been inundated by the rising sea. Pleistocene-aged Aboriginal sites on the South Coast include Bass Point, dated at 17,010+/-650 BP (ANU-536) (Bowdler 1970, p.254) and Burrill Lake rock shelter, dated at 20,830+/-810 BP (ANU-138) (Lampert 1971, p.122). Test excavations undertaken at the Wollingurry Point midden dated the site to 3360 +/- 90 years BP (Navin Officer 1987, p.104)

Several studies of site patterns and distribution have been completed for the Illawarra and South Coast. Regional overview (Figure 7).

Sefton's (1984) study formed part of the Local Environmental Study prior to the Stage 1 of the West Dapto Release Area (WDRA) development in Horsley, north of the study area. A copy of the Sefton's report could not be obtained, but the review was revised from the AMBS study (2006).

The following key elements constitute Sefton's site predictive model of the WDRA:

- Archaeological sites at Bass Point provide evidence of Pleistocene occupation, and there is no evidence to suggest West Dapto could not have been occupied at this time.
- It is possible that stratified occupational deposit could be located in the Pleistocene sediments of the flood plains at West Dapto. Stratified occupational deposit of Holocene age is also likely (and more possible) to occur in the floodplain sediments.
- Ethnohistorical records suggest two major zones of exploitation: (1) the coastal zone, including the shoreline, off shore islands and Lake Illawarra; and (2) the inland zone, including undulating tablelands. Groups who used both areas were small, mobile, and associated with a locality, but also ranged over larger areas. On this basis, it could be expected that the West Dapto area could have been exploited from both east and west directions, in addition to tracks along ridgelines.
- The Lake Illawarra shoreline presents restricted areas for campsites relative to the concentrated resources. Midden sites may not represent base camps (occupation sites) but instead preferred sites for resource exploitation. These preferred sites are expected to occur within two kilometers of the Lake Illawarra shoreline, and would have been established around the lake shore.
- The resources of West Dapto (flora, fauna, available water) would have made the locality attractive to occupation and exploitation. However, resources would have been scattered and at low density in comparison to the lake, and the locality was probably not economically self-contained. Base camps would not have been suitable for exploitation of these resources.
- Stone materials are not sourced within the area, with the exception of latite cobbles and occasional quartz pebbles. Consequently, stone would have been conserved at camp sites.
- Tracks connecting the coast to the interior would be expected through the West Dapto area, due to its geographic location between the two. Aboriginal tracks are usually along ridges, and consequently, sites could be expected in the saddles of ridges.
- Along the eastern coastal plain and the foothills of the escarpment to the west, sites are likely to occur on ridgelines or on dry level land within 100 metres of a creek line.

- In the foothills of the Escarpment to the west, sites may also occur further away from water on saddles of the Marshall Mount spur and on level areas of smaller ridgelines along the escarpment slopes and foothills.
- Extractive sites will also be located in West Dapto. These would occur as scarred trees, isolated large cores, tools of latite or small isolated stone artefacts. These sites may occur in all landform contexts, although scarred trees could only be identified in areas where trees have not been fired or cleared.
- It is not expected that latite quarry sites will occur at West Dapto. Although these tools have been located in adjacent areas on the shores of Lake Illawarra, those tools have been prepared from pebbles or cobbles and not from quarried materials (AMBS 2006, pp.87–88).

The following four areas were identified in WDRA as having high archaeological potential:

- All level areas of the Western foothills zone and the Coastal Plain within 100 metres of a creek located on:
  - Quaternary deposited flood plains.
  - Budgong Sandstone.
  - Berry Siltstone.
- Saddles on the ridges of Marshall Point spur.
- Level areas in the Forest Creek Valley in the Escarpment Protection Zone.
- Level areas of the escarpment slopes on the topographic benches and bluffs.

Three main categories of sites being of potential significance were also identified:

- Stratified occupational deposits: may occur in the flood plain deposits of West Dapto, these deposits would have significant research potential and would be rare. Such a site may contain stone artefacts, food refuse and charcoal, which could be dated to establish a chronology of occupation of West Dapto. This would be significant to the public and be of educational significance. If the site were of Pleistocene age, it would be of major heritage significance to the Australian people, such as that identified at Bass Point.
- Surface camp sites: these unstratified deposits are likely to contain stone artefacts, and possibly, remnants of shell and charcoal. Bone is unlikely to have survived. These sites may provide information on settlement patterns, economic exploitation and stone tool manufacture and maintenance. These sites have research potential, but it is also predicted that they will be the most common site type at West Dapto.
- Scarred trees: although the identification of scarred trees is recognized to be problematical, any found in West Dapto will be of research potential (i.e. study of individual tree scars, relationship with other site types). Scarred trees are rare in the North Illawarra as in most areas, mature native trees have been burnt, and the rarity of scarred trees increases their significance (AMBS 2006, p.90).

Sefton (1990) completed an archaeological survey for West Dapto Stage One Release Area in 1990, located to the west of the study area, south of Bong Bong Road. The survey targeted areas previously identified as having high archaeological potential, i.e. all level areas 100 metres of a creek situated on Quaternary deposits (floodplains) and/or Budgong Sandstone, and areas with remnant mature native vegetation. Three new Aboriginal sites were identified: two scarred trees Bong Bong 1 (AHIMS 52-2-1542) and Bong Bong 3 (52-2-1543) and an artefact scatter, Bong Bong 2 (AHIMS 52-2-1544). Two scars are located on Forest Red Gum *Eucalyptus tereticornis* and Narrow-leaf Stringybark *Eucalyptus eugenoides* trees. Two stone artefacts associated with Bong Bong 2 were located in an erosion gully above a cow track, approximately 2 metres from Reid Creek. Sefton concluded that the alluvium of the Robins Creek floodplains would contain significant stratified

archaeological deposits. However, floodplains associated with the Mullet Creek tributary, derived from Budgong Sandstone, would have been waterlogged and sites were unlikely to be present below alluvial deposits.

Koettig (1992) conducted an assessment of Aboriginal sites for the electrification of the Dapto to Kiama railway line. Landforms surveyed included the low lying coastal plain and foothills. Due to the levels of previous disturbance during the construction of the railway it was considered that any possible archaeological sites would have been destroyed. No sites were located during the survey. Since the railway crosses areas that are deemed as having high archaeological sensitivity, such as dunes, old terraces, areas close to water sources that have not been affected by the recent development, archaeological material could still remain. Any new development outside the boundary of the railway easement was assessed as having archaeological sensitivity.

Navin Officer (1993) completed archaeological testing of a proposed residential subdivision on the southern side of Bong Bong Road, West Dapto. This investigation followed on from Silcox's 1993 recommendation that the site had three areas of potential archaeological sensitivity. Area WD1 located within the lower slope and undulating creek flat landform was divided into five transects which were then sampled with a 35 test excavation units consisting of combination of auger holes and spade probes. One surface artefact was located at the western end of the identified WD1 Area. A series of ten random probes was excavated at 1to2 metres apart averaging 28 centimetres in depth. Four additional artefacts were recovered and the area was deemed as a site WD1, registered on AHIMS 52-2-1688. WD 2 Area located within a low rise landform between a creek and a swampy cut-off channel had a single transect running through it with a total of five test excavation units and no artefacts recovered. WD 3 Area was subject to only three random spade probes as it had a similar landform as WD 2; no artefacts were recovered.

Artefacts at the site WD1 (AHIMS 52-2-1688) were recovered from upper 26 centimetre of the loam deposit within 1 metre by 2 metre area, and consisted of silicified wood, chert and quartz flakes and one unidentified sedimentary core. Navin Officer stated that it was unlikely the artefacts were *in situ*, due to the extensive land use modifications of the topsoil from where artefacts were recovered. Given the dense grass cover, size of the test area and the limitations of subsurface testing, Navin Officer considered that there was a possibility that more artefacts were present both on surface and subsurface in WD1 Area. However, potential for archaeologically significant sites and/or undisturbed archaeological deposits was assessed to be minimal. Consent to Destroy was issued by the National Parks and Wildlife Service in 1993 in order to destroy the site WD1 (AHIMS 52-2-1688).

Navin Officer (1994) was commissioned by Camp Scott and Furphy to undertake an archaeological survey of the proposed Illawarra water quality project installation at Kembla Grange. The survey was a targeted survey of creek banks and flats, areas of exposure around an existing dam, and flat ground on the southern part of their study area. These areas had higher degree of ground surface visibility and were considered as being favoured by Aboriginal people for occupation activities. Footslopes, creek banks, creek flats and plains were all aggrading landforms due to colluvial deposition and mass soil movement and deposition of sediments by water. The steep slopes on the spurs and in the north were sampled (1994, p. 7). During this survey there were no new Aboriginal sites identified. It was argued that archaeological potential in the proposed works area was low due to the results of previous testing in the similar landforms.

AMBS (2006) completed an Aboriginal Heritage Management Plan for the West Dapto Release Area (WDRA). This large scale study was commissioned by the Wollongong City Council and encompasses the study area. From the initial survey program, a total of 24 archaeological sites; 13 open camp sites, 6 isolated finds, 5 scarred trees were located within the boundaries of the WDRA study area. These were positioned on all landforms including creek lines (6), alluvial flats (3), spanning creek lines and alluvial flats (3), hillslopes (8) and spur crests (4). A second stage of assessment consisted of subsurface testing of a 100 square metres area

(100, 1 metre by 1 metre test pits) was undertaken across all representative landforms of the Mullet, Duck and Marshall Mount Creek catchment area.

A total of 425 artefacts (353 from within < 20 centimetres of deposit) were recovered from the following landscape contexts:

- Hillslopes (158, of which 146 were from one test pit).
- Alluvial flats -Pleistocene and Holocene terraces more than 10 metres away from stream channels (118).
- Streams- edges of Pleistocene and Holocene terraces within 10 metres of stream channels (86).
- Spur crests (63).

A range of raw materials were represented including, chert, quartz, quartzite, silcrete, silicified tuff and fine-grained siliceous. Artefact types included broken flakes, flakes, flaked pieces and cores. The range of raw materials and artefact types was considered characteristic of the region by AMBS.

AMBS concluded that from known site patterning it is likely that additional archaeological sites may occur throughout all landforms of the WDRA, although at varying site and artefact densities, and subsequently all parts of the WDRA are considered to have some archaeological potential. AMBS classified the current study area as low to moderate potential. In general, the highest artefact density was encountered along second-order streams, followed by the first order streams, spur crests and then hillslopes. Although artefact numbers recovered from individual test pit was low, high artefact recovery across all the landforms illustrate that the use of WDRA area was widespread, but not intensive. It was concluded that low density artefact scatters would be relatively common within the entire WDRA area.

The report recommended further investigation and management of those areas considered to have higher archaeological potential, including a number of spur crests within the Mullet Creek corridor, the benched foot slopes within the Escarpment foothills adjacent to creek lines and the lower tributaries of major creeks. These landforms would have provided camping sites, functioned as travel routes or provided a range of resources.

Areas of cultural value highlighted by the Aboriginal stakeholders throughout the development of this report are closely related to the archaeological record and the natural environment. All archaeological sites were identified as having cultural values, with the connection between cultural and natural values being emphasised. Large scatters and scarred trees were considered of higher significance, as were those sites retained within a natural setting. Conservation of important archaeological sites and natural areas such as creek lines and vegetated areas was a common theme identified among the Aboriginal

As part of the WDRA, AMBS commissioned Philip Hughes to complete a geomorphology / archaeological testing program prior to the commencement of the larger sub-surface investigation program. Hughes (2005) excavated a series of test pits using a combination of hand excavation and a backhoe within various landforms identified by AMBS (2006). The geomorphic testing revealed that while all landforms had the potential to contain artefact-bearing deposits, archaeological evidence for Aboriginal occupation and use of the Pleistocene terraces would be restricted to the Holocene period. Artefact bearing deposits across all landforms comprise soft to firm soils and sediment. The depth of deposits varies across landforms, with the shallowest sediments occurring on ridges and hill slopes, and the deepest sediments occurring on Holocene terraces. 'Richer' archaeological deposits could be expected within Holocene terraces, but they would be disturbed by floods and perhaps buried in deeper alluvium. Artefacts were retrieved from alluvial flats at a maximum depth of 60 to 70 centimetres.

Biosis (2009) was commissioned by Connectland Pty Ltd to undertake Aboriginal archaeological and cultural heritage assessment for the proposed Illawarra Employment and Teaching Centre, West Dapto, located approximately 3.3km North West of the study area. The assessed area encompassed 42.88 hectares to the

north of Bong Bong Road and west of Mullet Creek. Archaeological survey was targeted towards areas that will be impacted by the proposed development, and landforms and areas identified in the predictive modelling as having high likelihood for the presence of sites, i.e. ridgelines and waterways. Two Isolated artefacts were identified during the site survey, Bong Bong Road IA1 (AHIMS 52-2-3659) to the immediate north of Bong Bong Road within the exposure around the tree, and Bong Bong Road IA2 (AHIMS 52-2-3660). Comprehensive review of AMBS study (2006) indicated that the newly recorded site 52-2-3660 was most likely already recorded site WDRA_AX_01 (AHIMS 52-2-3289). Both Bong Bong Road IA1 and Bong Bong Road IA2 were assessed as having low scientific significance and they were considered to be a common occurrence within the region (Biosis 2009, p.42-3). Their presence conforms to the site predictive model for the region where Aboriginal sites are likely to occur on level, well-drained ground adjacent to wetlands and resources. It was recommended that both sites be salvaged and relocated in the event impacts cannot be avoided.

3.2.1 Local overview

A number of Aboriginal cultural heritage investigations have been conducted within the region (within approximately five kilometres of the study area). Most of these investigations were undertaken as part of development applications and included surface and sub-surface investigations. These investigations are summarised below.

Sefton (1980) undertook an archaeological survey of the proposed transmission line routes in the West Dapto-Yallah Area of the City of Wollongong. During this survey two archaeological sites were identified. Registered site Yallah Site 1 (52-5-0123) consisted of one isolated artefact that was located on the northern bank of a tributary of Duck Creek, made from fossilised wood. Site Yallah Site 2 (52-5-0122) was located within 150 metres of the Lake Illawarra on a lower slope and is a sparse scatter of seven artefacts made from chert, jasper and rhyolite. This site was located on a gradual slope, and has been previously disturbed by quarrying, erosion and underground services. Both sites are approximately 3 kilometres south-east of the study area and are within close proximity to reliable, permanent sources of water on flat elevated grounds. It was recommended that any excavations in the vicinity of site Yallah 2 be monitored, and no impacts were proposed to site Yallah 1.

Dallas and Navin (1987) conducted an archaeological survey along the southern foreshore of Lake Illawarra and on Bevans, Picnic, Berageree and Werrang islands approximately 7 kilometres south east of the current study area. The survey identified five new shell midden sites and one previously recorded midden site (AHIMS 52-5-0119). In their discussion of the survey results Dallas and Navin suggested that the locations of the middens on the islands was not necessarily indicative of preferential use. Rather, they suggest it was more likely that the lack of disturbances on the islands compared to the more heavily disturbed Illawarra Lake foreshore has resulted in the destruction of foreshore middens and the preservation of island middens.

Navin Officer (1997) undertook an archaeological investigation of a proposed residential subdivision at Lot 1 DP253917, Mount Brown Road in South Dapto, approximately 2.5 kilometres west of the current study area. A survey was conducted as part of this assessment, but the survey did not identify any Aboriginal sites. The absence of sites was attributed to a number of factors including the very low ground surface visibility, a lack of specific resources in the area, and shallow soils with an absence of colluvium material adjacent to drainage lines. Previous land use practices also indicated that little material would have remained *in situ* due to disturbances. The results of this survey were consistent with those obtained from other archaeological surveys in the local area and with the regional pattern of sparse site occurrence in the low hilly lands interior of Lake Illawarra and the coastal plain.

Comber Consultants Pty Ltd (2010) undertook an Aboriginal archaeological assessment for the proposed bike and pedestrian path around Lake Illawarra, which the current study area partly lies within. As part of this assessment Comber undertook basic predictive modelling and developed predictive statements for various

site types. These statements indicated that there was a possibility for middens, burials, open camp sites, axe grinding grooves and isolated finds to be present in the study area.

Following background research, Comber conducted a survey of their study area. No Aboriginal archaeological sites were recorded during this survey, but Area 2, which the current study area lies partially in, and Area 4 of their study area were identified as having a high potential to contain sub surface archaeological deposits.

Considering a high number of previously recorded Aboriginal archaeological sites (13) within the vicinity of the study area and the landform they were in (Lake Illawarra foreshore), it was recommended that archaeological sub-surface testing be undertaken in Areas 2 and 4 in order to determine the existence, and then nature and extent of any such deposits.

3.2.2 Previous Aboriginal archaeological test excavations within the study area

Biosis (2010) conducted an Aboriginal Archaeological Assessment of the Tallawarra lands for TRUenergy which encompassed the current study area. Biosis was commissioned to conduct sub-surface testing for a number of areas assessed by Kelleher and Nightingale as having moderate and high archaeological sensitivity.

A total of 10 areas were excavated across five landform types (Figure 7). These landforms included foreshore, spur line, drainage line, hill slope, and creek line landforms. The excavations identified 24 stone artefacts and one piece of ochre across the 10 excavation areas; the highest number of artefacts were uncovered in the creek line landform (n=13) followed by the drainage line landform (n=10). The foreshore and hill slope landforms each contained one artefact and the spur line did not contain any. The artefact assemblage consisted of a range of raw materials including chert, quartzite, silcrete, basalt, chalcedony and siltstone.

An analysis of the soil profiles within various landform units in the study area indicated that depth of deposit increased with proximity to water (specifically Duck Creek). Disturbances to the soil stratigraphy were found to be limited to the upper (top soil) layer, with lower stratigraphic units showing very low to no evidence of previous disturbance. Two areas (TLPD-2 and TLPD-3) within the current study area were tested during the 2010 test excavation program. The test pit soil profiles within TLPD-2 and TLPD-3 (AHIMS 52-5-0613), were all noted to have four distinct stratigraphic units displaying little to no evidence of previous disturbance in the topsoil and lower layers.

Biosis concluded that the low number of artefacts indicated that Aboriginal people were using the Tallawarra Lands, with occupation focusing on Duck Creek, but it was likely sporadic or low density.

Biosis (2011) were commissioned by the Lake Illawarra Authority to undertake archaeological assessment and test excavations of the Tallawarra recreational shareway based on the recommendations of Comber. The Tallawarra Lands development encompasses parts of the area assessed by Biosis.

As part of this assessment Biosis undertook background research and used it to construct several predictive statements for the study area. These statements indicated that:

- Midden shell and lithic material have been known to occur on sand bodies such as coastal beach dune systems, elevated ground adjacent to wetlands such as low gradient basal colluvial slopes, terminal spur line crests and alluvial terraces along valley floor drainage corridors.
- Artefact scatters may be identified anywhere within the study area but they are more likely to be identified near water-related landforms and on gently inclined slopes within 100 metres of water. Stone artefacts are more likely to consist of sandstone, quartz or volcanics.
- Shelters, grinding grooves and raw materials suitable for stone tool manufacture will not occur within the study area due to a lack of suitable geology.

- Scarred trees may occur anywhere within the study area where mature trees remain.
- A burial was recorded on the shores of Lake Illawarra. Due to alluvial deposits within the study area and previously recorded burial, there is a possibility that unrecorded burials may be located in the area.

The test excavations undertaken as part of the assessment involved 157 auger holes along the foreshore. The excavations identified one new artefact scatter Tallawarra Point 1 (AHIMS and extended the pre-existing site Tallawarra Power Station Midden (AHIMS 52-5-0070). Two artefacts consisting of a quartz flake fragment and a silcrete geometric microlith were identified at Tallawarra Point 1. It was suggested that this site was likely representative of transient occupation. Six stone artefacts were also excavated in a tidal creek landform directly south of Tallawarra Power Station Midden (AHIMS 52-5-0070). The artefacts consisted of four chert flakes, one quartz flake and one silcrete flake. This scatter was identified as part of the Tallawarra Power Station Midden (AHIMS 52-5-0070). Biosis suggested that the Tallwara Power Station Midden was representative of camping activities or frequent travel through the area. No midden material was encountered during the test excavations.

Acknowledgements: Basemap © Land and Property Information 2016

Legend

Study area

Biosis 2010 Test Pits

- No artefacts present
- Artefact(s) present

Figure 7 Previous test excavations

0 100 200 300 400 500

Metres
Scale: 1:9,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56

N

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 24090
Date: 21 October 2019,
Checked by: RAM, Drawn by: LH, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_AR_F7_PrevTesting

3.2.3 AHIMS site analysis

A search of the Aboriginal Heritage Information Management System (AHIMS) database (Client Service ID: 455755) identified 107 Aboriginal archaeological sites within a three square kilometre search area, centred on the proposed study area. AHIMS search results are provided in Appendix 1.

Two AHIMS sites are located within the study area and two within 10 metres of the study area:

- Boomberry Point 1 (AHIMS 52-5-0223) is recorded as a small dispersed shell midden comprising of *Andara trapezia*. It is likely that Boomberry Point 1 has been mapped incorrectly as the site card describes its location as being located on the track running from Tallawarra Power Station to Boomberry Point across Tallawarra Point Headland, three metres south of an unnamed creekline. It was noted that the soil matrix is slightly darker than the surrounding soil and is probably related to the breakdown of charcoal. The highly fragmented shell was visibly exposed on the track and extended under the grass on the side of the track towards the creekline. No artefacts were found even though visibility on the track was 100%. The site is heavily disturbed by horse traffic and the deposition of building rubble and rubbish.
- Elizabeth Point (AHIMS 52-5-0225) is recorded as an isolated artefact consisting of a grey chert flake fragement. The site is located along a walking track from Tallawarra Power Station to Boomberry Point across Tallawarra Point Headland. It is also likely that Elizabeth Point has been mapped incorrectly as its current location is further west.
- Gilba Road 1 (52-5-0642) is recorded as an isolated artefact located at the beginning of a walking track towards Boomberry Point. This site is currently mapped in the middle of Lake Illawarra; therefore, is also incorrectly mapped and the site is likely located at the end of Gilba Road within 10 metres of the study area.
- Gilba Road 2 Fill 1 (AHIMS 52-5-0643) is recorded as an isolated artefact; however, the location is not described. The site card does include a map showing the location of shell scatter adjacent to the walking track, which extends for approximately 120 metres.

Table 3 provides the frequencies of Aboriginal site types in the vicinity of the study area. The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. The descriptions and maps were relied upon when notable discrepancies occurred in the locations of sites.

It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and a modified tree, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 129 results presented here, compared to the 107 sites identified in AHIMS.

Table 3 AHIMS site type frequency

Site type	Number of occurrences	Frequency (%)
Aboriginal ceremony and dreaming	4	3.10
Artefact	83	64.34
Modified tree	1	0.77
PAD	15	11.63

Site type	Number of occurrences	Frequency (%)
Shell	25	19.38
Stone Arrangement	1	0.77
Total	**129**	**100**

A simple analysis of the Aboriginal cultural heritage sites registered within the three square kilometre buffer of the study area indicates that artefacts are the most commonly recorded site type (n=83, 64.34%). This is followed by shells sites (n=25, 19.38%) and PAD sites (n=15, 11.63%). Aboriginal ceremony and dreaming (n=4, 3.10%), modified tree (n=1, 0.77%) and stone arrangement (n=1, 0.77%) were also recorded in the region.

Legend

- Study area
- AHIMS record

Figure 8 AHIMS records near the study area

NOT TO BE MADE PUBLIC

0 500 1,000 1,500

Metres
Scale: 1:35,000 @ A3
Coordinate System: GCS GDA 1994

N

Biosis Pty Ltd

Ballarat, Brisbane, Canberra, Melbourne, Sydney,Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: amurray, Generated by: amurray
Location:P:\30400s\30437\Mapping
30437_AR_F8_AHIMS.mxd

3.3 Discussion

Ethno-historical information regarding the study area indicates that the region was intensively occupied by the Wodi Wodi of the Dharawal language group before European occupation.

The current study area is characterised by the coastal plain landscape, and is situated on the open banks of Lake Illawarra backing onto the slopes of the Mount Brown. The proximity to Lake Illawarra would have provided access to aquatic animals which would have been used by Aboriginal groups in the area as a food source and for tool production. The easy access to aquatic species should result in the potential for shell middens to be present in the study area. This is supported by AHIMS data which showed that middens were the second most common site type in the region. Geology of the Illawarra region also provided access to stone resources useful for tool manufacture. The AHIMS data indicated that stone artefacts are the most common site type in the region so they are likely to be present in the study area

Previous archaeological work within the study area has not only focussed on specific development activities but has recognised the archaeological and cultural landscape values of the locality. The previous studies provide a general overview of Aboriginal archaeological site modelling and predictive behaviour within the current study area. In general, previous archaeological work indicates that areas of archaeological potential will occur where disturbance has been limited, and the most likely site type to be encountered will be middens sites and artefacts.

3.3.1 Predictive Statements

A number of predictive statements have been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist(ed) throughout the study area and where they are more likely to be located.

The predictive statements are based on:

- Site distribution in relation to landscape descriptions within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a number of predictive statements have been developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area (Table 4). The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

Table 4 Aboriginal site prediction statements

Site type	Site description	Potential
Flaked stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	High: Stone artefact sites are the most common previously recorded site in the region, occurring across a wide range of landforms and within the study area. They have high potential to be present in undisturbed areas within the study area.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Moderate: Shell midden sites have been recorded within the vicinity of study area. The proximity of the study area to Lake Illawarra indicates a high potential for the presence of shell middens
Quarries	Raw stone material procurement sites.	Low: There is no record of any quarries being within or surrounding the study area.
Potential archaeological deposits (PADs)	Potential sub surface deposits of cultural material.	Moderate: PADs have been recorded in the region across a wide range of landforms. They have the potential to be present in undisturbed landforms of the study area
Modified trees	Trees with cultural modifications	Low: Due to extensive vegetation clearing from of the study area there is low potential for modified trees.
Axe grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	Low: The geology of the study area lacks suitable horizontal sandstone rock outcrops for axe-grinding grooves. Therefore there is low potential for axe grinding grooves to occur in the study area.
Burials	Aboriginal burial sites.	Low: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are not commonly associated with burials.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	Low: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present in the study area.
Aboriginal ceremony and Dreaming Sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal	Low: There are currently no recorded mythological stories for the study area.

Site type	Site description	Potential
	informants.	
Post-contact sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	Low: There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal places	Aboriginal places may not contain any "archaeological" indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	Low: There are currently no recorded Aboriginal historical associations for the study area.

4 Archaeological survey

A field survey of the study area was undertaken on 29 June 2017. The field survey sampling strategy, methodology and a discussion of results are provided below.

4.1 Archaeological survey objectives

The objectives of the survey were to:

- To attempt to re-identify Aboriginal archaeological sites Boomberry Point 1 (AHIMS 52-5-0223), Elizabeth Point (AHIMS 52-5-0225), Gilba Road 1 (AHIMS 52-5-0642) and Gilba Road 2 Fill (AHIMS 52-5-0643) previously identified in or immediately adjacent to the study area.
- To undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of potential archaeological deposits (PADs).

4.2 Archaeological survey methodology

The survey methods were intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area.

4.2.1 Sampling strategy

The survey effort targeted these portions of the study area:

- All landforms (including each occurrence of a specific landform type that will be impacted) that will be potentially be impacted.
- Landforms with a higher potential for Aboriginal heritage and justifying the selection of these landforms.

4.2.2 Survey methods

The archaeological survey was conducted on foot with a field team of one archaeologist. Recording during the survey followed the archaeological survey requirements of the code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform.
- Photographs of the site indicating landform.
- Evidence of disturbance.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, Identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit were possible. Any potential Aboriginal objects observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

4.3 Archaeological survey results

A total of five transects were walked across three landforms (Figure 9). This follows the methodology set out in Burke and Smith (Burke & Smith 2004, p.65) which states that a single person can only effectively visually survey an area of two linear metres. No new Aboriginal sites or PADs were identified in the study area. The results from the field survey have been summarised in Table 5 below.

The Northern Precinct consists of a crest running through the southern portion of the study area, an open drainage depression in the centre and a simple slope and flats associated with Lake Illawarra (Table 6, Plate 3 and Plate 4).

4.3.1 Constraints to the survey

With any archaeological survey there are several factors that influence the effectiveness (the likelihood of finding sites) of the survey. The factors that contributed most to the effectiveness of the survey within the study area were visibility, exposure and disturbance.

4.3.2 Visibility

In most archaeological reports and guidelines visibility refers to ground surface visibility, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (NPWS 1997). Visibility within the study area was generally poor, with areas of exposure isolated to disturbance associated with the horse ring, dam and fence lines. Visibility was 80% within these areas (Plate 1).

4.3.3 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, NPWS 1997). Overall, the study area displayed areas of exposure of approximately 5%.

4.3.4 Disturbances

Disturbance in the study area is associated with natural and human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring. Disturbances associated with recent human action are prevalent in the study area and cover large sections of the land surface. The agents include residential development such as landscaping and construction of residential buildings; farming practices, such as initial vegetation clearance for creation of paddocks, fencing and stock grazing; light industrial practices such as creation of artificial dams within the study area. Areas that have gone through disturbance are associated with horse ring, dams, fence lines and infrastructure associated with the Tallawarra Power Station (Plate 2).

Plate 1 **The study area showing poor surface visibility due to vegetaton cover, facing south**

Plate 2 **Disturbance associated with the construction of horse ring and dams, facing north**

Plate 3 **Crest running through the southern part of the study area, facing west**

Plate 4 **Simple slope down towards open drainage depression, facing east**

Table 5 Survey coverage

Survey Unit	Landform	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
1	Creek line	53,175	80	5	1,329	2.49
2	Crest	64,767	80	5	1,619	2.49
3	Hill slope	272,730	80	5	10,909	3.99

Table 6 Landform summary

Landform	Landform area (m²)	Area effectively surveyed (m²)	Landform effectively surveyed (%)	No. of Aboriginal sites	No. of artefacts or features
Creek line	53,175	1,329	2.49	0	0
Hill slope	64,767	1,619	2.49	0	0
Crest	272,730	10,909	3.99	0	0

Legend

- Study area
- Transcect

Figure 9 Survey coverage

0 50 100 150 200

Metres
Scale: 1:4,000 @ A3
Coordinate System: GDA 1994 NSW Lambert

N

biosis
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Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_AR_F9_SurveyCoverage

Acknowledgements: Basemap © Land and Property Information 2016

4.3.5 Discussion of archaeological survey results

The study area is located within a crest and simple slope landform pattern associated with a creek line that drains into Lake Illawarra. There is one soil landscaped present within the study area, an erosional soil landscape called the Shellharbour soil landscape. Erosional soils have a high to very high erodibility rating and would therefore be susceptible to frequent soil movement and result in poor preservation of archaeological material at shallow depths but would potentially lead to exposures of any deeper archaeological deposits were topsoil has eroded away.

The field survey revealed that parts of the study area had been subject to previous ground disturbance due to construction of towers for the Tallawarra Power Station. These areas would have displaced surface cultural material and disturbed deeper buried archaeological deposits. Having said that, most of the study area had only limited disturbance that was due to the construction of horse training rings, dams and fence lines, animal trampling from horse agistment. Although these processes would displace surface cultural material, they would not affect deeper buried archaeological deposits. Due to the low levels of ground surface visibility and exposure the AHIMS sites recorded in and adjacent to the study area could not be relocated.

A review of previous archaeological studies, surveys, test excavations and regional predictive modelling indicates that all landforms within the study area were utilised to some degree by Aboriginal people in the past. This has concluded that:

- Majority of the test pits conducted by AMBS (2006) in the West Dapto Release Area contained artefacts were located within alluvial flats, following by hillslopes, then spur crests , then 3rd order, then 2nd order, then 4th and at last 1st order creek lines.
- AHMS (2012) in excavations further along Robins Creek determined that alluvial flats had the highest density of artefacts (30.2 per metre square), followed by hillslope (17.3 metre square) and spur crest (16.9 metre square).
- Previous investigations along Robins Creek have determined that the alluvial terraces associated with this landform have the potential to contain cultural material which appears to be well preserved *in situ*. Artefacts within the *Fairy Meadow* soil landscape at this location were retrieved from between 60 to 80 centimetres depth.
- Predictive modelling indicates that of sites located on stream landforms, majority were along the 3rd order, following by 4th, then 2nd and last 1st order creek lines.

Based on the site survey and previous assessments the low spur/crest running roughly east-west through the center of the study area has been assessed as having moderate subsurface archaeological potential (Figure 10). Previous research indicates that the landform is likely contain low density artefact sites or isolated artefacts that were discarded as Aboriginal people travelled through the landscape. The test excavation program conducted by Biosis in 2010 indicated that this landform unit has been subject to low levels of previous ground disturbance with four distinct and intact soil horizons identified throughout the testing locations in the northern precinct.

Areas that have undergone significant previous disturbance would have removed sub-surface deposits from their original contexts and were assessed as low potential as a result (Figure 10). Hillslopes were also assessed as low potential as they tended to be sloped and at the time of survey were heavily waterlogged and unsuitable for occupation or travel.

Legend

Study area

Archaeological potential

Moderate

Low

Figure 10 Archaeological potential

0 50 100 150 200

Metres

Scale: 1:4,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

N

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Location:P:\30400s\30437\Mapping
30437_AR_F10_ArchPotential

Acknowledgements: Basemap © Land and Property Information 2016

5 Test excavation methodology

The principle objectives of the sub-surface test excavation program is to identify and understand the nature, extent and significance of any subsurface archaeological material located within areas of archaeological sensitivity within the study area.

The aims of the testing program are to:

- Determine whether sub-surface archaeological deposits exist which may be impacted upon by the development. If so, to determine the extent and nature of such deposits.
- Identify whether the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse and interpret any archaeological finds (such as stone artefacts, shell, hearths, knapping floors etc.) recovered during the testing program.
- Inform current knowledge of Aboriginal occupation and land use models of the region.
- Provide management and mitigation measures for Aboriginal archaeological objects identified during the subsurface testing program.

5.1 Research questions

Research questions provide a framework for undertaking sub-surface investigations and ensure that the information collected during the sub-surface testing program contributes to the knowledge of the sites and the broader archaeological record. Research questions include:

- *Do non-disturbed or minimally-disturbed soil profiles exist within the potential archaeological deposits associated with sites AHIMS 52-5-0223/Boomberry Point 1 and AHIMS 52-5-0643/Gilba Road 2 Fill 1?*
- *What species of shell or vertebrate exist within the deposits and what can they tell us about the subsistence patterns of Aboriginal people living in the area?*
- *Are the species of shell or vertebrate remains found within the deposit comparable with the species found in other excavated middens within the region?*
- *What management is appropriate? Does the area warrant further investigation, conservation, or could proposed development works proceed as planned?*

5.2 Test excavation methodology

Test excavations will be conducted within the study area and be conducted by hand. Test excavation within the study area will conform to the following methodology:

- Test excavation will be undertaken within areas of moderate potential identified and within the vicinity of Boomberry Point 1 (AHIMS 52-5-0223) and Elizabeth Point (AHIMS 52-5-0225).
- At Boomberry Point 1, auger holes will be dug at 10 metre intervals to establish the presence of absence of midden material. Where augering shows dense archaeological deposit, a 1 metre x 1 metre pit will be excavated in order to determine the presence and nature of the sub-surface deposit.

- It is possible that Boomberry Point 1 has been mapped incorrectly as the site card describes its location as on the track between Tallawarra Point and Boomberry Point, 3 metres south of an unnamed creekline. Therefore, auger holes will placed as close as possible to the boundary of the study area in the vicinity of this location. Auger holes will be dug at 10 metre intervals, or other justifiable and regular spacing, to establish the extent of the midden, if encountered. Where augering shows dense archaeological deposit, a 1 x 1 metre pit will only be excavated in order to determine the presence and nature of subsurface deposits.
- At Elizabeth Point, up to four 1 metre x 1 metre pits (with a provision of joining two test pits together) will be excavated in order to determine the presence and nature of subsurface deposits. The test pits will be spaced between 5 and 15 metres apart or other justifiable and regular spacing (being no smaller than five metres).
- Additional test excavations will also be undertaken as close as possible to the location of Gilba Road 2 Fill 1 (AHIMS 52-5-0643), which is located on the boundary of the study area, and at Gilba Road 1 (52-5-0642), which is located 15 metres north of the study area.
- At Gilba Road 2 Fill 1, a grid will also be established along the length of the shells scatter identified and indicated on the site card (approximately 120 metres in length). Auger holes will be dug at 10 metre intervals, or other justifiable and regular spacing, to establish the extent of the midden, if encountered. Where augering shows dense archaeological deposit, a 1 x 1 metre pit will only be excavated in order to determine the presence and nature of subsurface deposits.
- Gilba Road 1 is located just outside the study area; therefore, 50 x 50 centimetre units along one transect will be placed as close as possible to this site. The test pits will be 20 metres or other justifiable and regular spacing (being no smaller than five metres). Test excavations units may be combined up to 1 metre x 1 metre to understand the site characteristics and to accommodate deep deposits if encountered.
- In areas of moderate potential, test excavations will be conducted in 50 x 50 centimetre units along transects at intervals of 40 metres or other justifiable and regular spacing (being no smaller than five metres). Test excavations units may be combined up to 1 metre x 1 metre to understand the site characteristics and to accommodate deep deposits if encountered.
- Test excavations units must be excavated using hand tools only including spades, handle shovels, hand auger and trowels.
- The first test excavation unit within Boomberry Point 1, Elizabeth Point, Gilba Road 1 and Gilba Road 2 Fill 1 will be excavated and documented in 5 centimetre spits. Based on the evidence of the first excavation unit, 10 centimetre spits or sediment profile/stratigraphic excavation (whichever is smaller) will then be implemented. If shell material is discovered, the pit will be excavated and documented in stratigraphic contexts.
- All material excavated from the test excavation units will be sieved using 3 millimetre aperture wire-mesh sieves.
- Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units (where safe excavation permits), and must continue to confirm the soils below are culturally sterile.
- All cultural material recovered from the test pits will be collected and brought to the Biosis office at 30 Wentworth Street, Port Kembla for analysis.
- All faunal remains recovered from the test pits will be analysed using the following method:

  - Minimum number of individual (MNI) animals represented in each discrete area and on site overall.
  - Minimum number of elements (MNE) represented in each discrete area and on site overall.
  - Number of species (NISP) represented in each discrete area and on site overall.
  - Dimensions of each element.
  - Butchery/heat marks.
  - Pathologies.
  - All faunal remains will be photographed in-situ to understand the relationship of the remains with other artefactual material.
- For each test pit or auger hole that is excavated, the following documentation will be taken:
  - Unique test pit identification number.
  - GPS coordinate of each test pit.
  - Munsell soil colour, texture and pH.
  - Amount and location of cultural material within the deposit.
  - Nature of disturbance where present.
  - Stratigraphy.
  - Archaeological features (if present).
  - Photographic records.
  - Context records.
- Test excavation units must be backfilled as soon as practicable due to safety issues.
- Any datable material will be collected for the purposes of radiometric, AMS or OSL dating. Datable materials will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office before being sent to the University of Waikato Radiocarbon Dating Laboratory.
- Test excavations can cease when enough information* has been recovered to adequately characterise the cultural material present with regard to their nature and significance within the study area.
- Following test excavation, an AHIMS Aboriginal Site Recording form must be completed and submitted to the AHIMS Registrar as soon as practicable, for each site that has been identified.

*Enough information is defined by OEH as meaning "the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance. This may include things like locally or regionally high object density: presence of rare or representative objects: presence of archaeological features: or locally or regionally significant deposits stratified or not" (DECCW 2010b, pp. 28).

5.3 Objects recovered during excavation

All cultural material recovered from the test pits will be labelled and bagged appropriately, including pit number. Aboriginal objects will be recorded in accordance with requirements 19 and 20 (where applicable) of the code. For the purposes of recording and analysis the artefacts will be temporarily stored at the Biosis

Wollongong office (30 Wentworth Street, Port Kembla 2505). Once the cultural material has been analysed, the cultural material can be managed in the following manners:

- Cultural material can be held by the Aboriginal community under a care and control agreement.
- Cultural material can be returned to country and reburied as soon as practicable in a secure location in accordance with requirements 16b and 26 of the Code of Practice.

6 Scientific values and significance assessment

The two main values addressed when assessing the significance of Aboriginal sites are cultural values to the Aboriginal community and archaeological (scientific) values. This report will assess scientific values while the Aboriginal Cultural Heritage Assessment Report will detail the cultural values of Aboriginal sites in the study area.

6.1 Introduction to the assessment process

Heritage assessment criteria in NSW fall broadly within the significance values outlined in the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter (Australia ICOMOS 2013). This approach to heritage has been adopted by cultural heritage managers and government agencies as the set of guidelines for best practice heritage management in Australia. These values are provided as background and include:

- **Historical significance** (evolution and association) refers to historic values and encompasses the history of aesthetics, science and society, and therefore to a large extent underlies all of the terms set out in this section. A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment.
- **Aesthetic significance** (Scenic/architectural qualities, creative accomplishment) refers to the sensory, scenic, architectural and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.
- **Social significance** (contemporary community esteem) refers to the spiritual, traditional, historical or contemporary associations and attachment that the place or area has for the present-day community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with local communities.
- **Scientific significance** (Archaeological, industrial, educational, research potential and scientific significance values) refers to the importance of a landscape, area, place or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

The cultural and archaeological significance of Aboriginal and historic sites and places is assessed on the basis of the significance values outlined above. As well as the ICOMOS Burra Charter significance values guidelines, various government agencies have developed formal criteria and guidelines that have application when assessing the significance of heritage places within NSW. Of primary interest are guidelines prepared by the Commonwealth Department of the Environment and Energy, DPIE and the Heritage Branch, NSW Department of Planning and Environment. The relevant sections of these guidelines are presented below.

These guidelines state that an area may contain evidence and associations which demonstrate one or any combination of the ICOMOS Burra Charter significance values outlined above in reference to Aboriginal heritage. Reference to each of the values should be made when evaluating archaeological and cultural significance for Aboriginal sites and places.

In addition to the previously outlined heritage values, the DPIE Guidelines (OEH 2011) also specify the importance of considering cultural landscapes when determining and assessing Aboriginal heritage values. The principle behind a cultural landscape is that 'the significance of individual features is derived from their inter-relatedness within the cultural landscape'. This means that sites or places cannot be 'assessed in isolation' but must be considered as parts of the wider cultural landscape. Hence the site or place will possibly have values derived from its association with other sites and places. By investigating the associations between sites, places, and (for example) natural resources in the cultural landscape the stories behind the features can be told. The context of the cultural landscape can unlock 'better understanding of the cultural meaning and importance' of sites and places.

Although other values may be considered – such as educational or tourism values – the two principal values that are likely to be addressed in a consideration of Aboriginal sites and places are the cultural/social significance to Aboriginal people and their archaeological or scientific significance to archaeologists. The determinations of archaeological and cultural significance for sites and places should then be expressed as statements of significance that preface a concise discussion of the contributing factors to Aboriginal cultural heritage significance.

6.2 Archaeological (scientific significance) values

Archaeological significance (also called scientific significance, as per the ICOMOS Burra Charter) refers to the value of archaeological objects or sites as they relate to research questions that are of importance to the archaeological community, including indigenous communities, heritage managers and academic archaeologists. Generally the value of this type of significance is determined on the basis of the potential for sites and objects to provide information regarding the past life-ways of people (Burke & Smith 2004, p.249, NPWS 1997), For this reason, the NPWS summarises the situation as 'while various criteria for archaeological significance assessment have been advanced over the years, most of them fall under the heading of archaeological research potential' (NPWS 1997, p.26). The NPWS criteria for archaeological significance assessment are based largely on the ICOMOS Burra Charter.

Research potential

Research potential is assessed by examining site content and site condition. Site content refers to all cultural materials and organic remains associated with human activity at a site. Site content also refers to the site structure – the size of the site, the patterning of cultural materials within the site, the presence of any stratified deposits and the rarity of particular artefact types. As the site contents criterion is not applicable to scarred trees, the assessment of scarred trees is outlined separately below. The site content ratings used for archaeological sites are provided in Table 7. Site condition refers to the degree of disturbance to the contents of a site at the time it was recorded. The site condition ratings used for archaeological sites are provided in Table 8.

Table 7 Site contents ratings used for archaeological sites.

Rating	Description
0	No cultural material remaining.
1	Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident

Rating	Description
	stratification.
2	Site contains a larger number, but limited range of cultural materials; and/or some intact stratified deposit remains; and/or are or unusual example(s) of a particular artefact type.
3	Site contains a large number and diverse range of cultural materials; and/or largely intact stratified deposit; and/or surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were deposited.

Table 8 Site condition ratings used for archaeological sites.

Rating	Description
0	Site destroyed.
1	Site in a deteriorated condition with a high degree of disturbance; lack of stratified deposits; some cultural materials remaining.
2	Site in a fair to good condition, but with some disturbance.
3	Site in an excellent condition with little or no disturbance. For surface artefact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down.

Pearson and Sullivan (1995, p.149) note that Aboriginal archaeological sites are generally of high research potential because 'they are the major source of information about Aboriginal prehistory'. Indeed, the often great time depth of Aboriginal archaeological sites gives them research value from a global perspective, as they are an important record of humanity's history. Research potential can also refer to specific local circumstances in space and time – a site may have particular characteristics (well preserved samples for absolute dating, or a series of refitting artefacts, for example) that mean it can provide information about certain aspects of Aboriginal life in the past that other less or alternatively valuable sites may not (Burke & Smith 2004, pp.247–8). When determining research potential value particular emphasis has been placed on the potential for absolute dating of sites.

The following sections provide statements of significance for the Aboriginal archaeological sites recorded during the surface survey for the assessment. The significance of each site follows the assessment process outlined above. This includes a statement of significance based on the categories defined in the Burra Charter. These categories include social, historic, scientific, aesthetic and cultural (in this case archaeological) landscape values. Nomination of the level of value—high, moderate, low or not applicable—for each relevant category is also proposed. Where suitable the determination of cultural (archaeological) landscape value is applied to both individual sites and places (to explore their associations) and also, to the Study Area as a whole. The nomination levels for the archaeological significance of each site are summarised below.

Representativeness

Representativeness refers to the regional distribution of a particular site type. Representativeness is assessed by whether the site is common, occasional, or rare in a given region. Assessments of representativeness are subjectively biased by current knowledge of the distribution and number of archaeological sites in a region. This varies from place to place depending on the extent of archaeological research. Consequently, a site that is assigned low significance values for contents and condition, but a high significance value for representativeness, can only be regarded as significant in terms of knowledge of the regional archaeology. Any such site should be subject to re-assessment as more archaeological research is undertaken.

Assessment of representativeness also takes into account the contents and condition of a site. For example, in any region there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region. The representativeness ratings used for archaeological sites are provided in Table 9.

Table 9 Site representativeness ratings used for archaeological sites

Rating	Description
1	Common occurrence.
2	Occasional occurrence.
3	Rare occurrence.

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are provided in Table 10.

Table 10 Scientific significance ratings used for archaeological sites

Rating	Description
1-3	Low scientific significance.
4-6	Moderate scientific significance.
7-9	High scientific significance.

Each site is given a score on the basis of these criteria – the overall scientific significance is determined by the cumulative score. This scoring procedure has been applied to the Aboriginal archaeological sites identified during the survey. The results are in Table 11.

6.2.1 Statements of archaeological significance

The following archaeological significance assessment is based on Requirement 11 of the Code. Using the assessment criteria detailed in Scientific Values and Significance Assessment, an assessment of significance was determined and a rating for each site was determined. The results of the archaeological significance assessment are given in Table 12 below.

Table 11 Scientific significance assessment of archaeological sites recorded within the study area.

Site name	Site content	Site condition	Representativeness	Scientific significance
Boomberry Point 1 52-5-0223	1	1	1	3 - Low
Elizabeth Point 52-5-0225	1	1	1	3 - Low
Gilba Road 1 52-5-0642	1	1	1	3 - Low
Gilba Road 2 Fill 52-5-0643	1	1	1	3 - Low

Table 12 Statements of scientific significance for archaeological sites recorded within the study area.

Site Name	Statement of Significance
Boomberry Point 1 52-5-0223	This site consisted of shell midden containing one shell species. The site was exposed on the side of a track in a hill slope landform. The site was noted to be badly disturbed with highly fragmented shell. The site has been assessed as having low archaeological significance.
Elizabeth Point 52-5-0225	Elizabeth Point (52-5-0225) was recorded as an isolated stone artefact located on a walking track. The artefact was a grey chert flake piece, common in the region and was observed to have been disturbed by the walking track. The site has been assessed as having low archaeological significance.
Gilba Road 1 52-5-0642	Site was recorded as a stone artefact located at the very beginning of a concrete pathway. Based on the location of this artefact and current aerial imagery the artefact has been disturbed as the concrete pathway now extends through the area the artefact was initially found in. The site has been assessed as having low archaeological significance.
Gilba Road 2 Fill 52-5-0643	The site was recorded as an artefact and was located in an area of fill, with shell and pottery also present. This location of the artefact in an area of fill indicates that the site has been disturbed and therefore has low archaeological significance.

7 Impact assessment

As previously outlined, the Project proposes to modify the existing concept approval for the Northern Precinct (MP 09_0131 MOD 1) to allow an increased residential lot yield. The DA and modification to the concept approval seeks to create the footprint and increase residential yield for the Northern Precincts.

7.1 Predicted physical impacts

The proposed works will include earthworks, the construction of new residential dwellings and associated infrastructure including roads, underground piping and cabling, and associated earthworks.

Within the study area, there are two recorded Aboriginal sites that may be subject to harm (52-5-0223, and 52-5-0225). It is expected that the potential of harm to 52-5-0223, and 52-5-0225 from the proposed development will be direct, with a total loss of value (Figure 11). Two AHIMS sites (52-5-0642, and 52-5-0643) are located within 10 metres of the study area, and may be subject to harm (Figure 11). It is expected that the potential of harm to 52-5-0642, and 52-5-0643 from the proposed development will be indirect, with a partial loss of value.

Strategies to avoid or minimise harm to Aboriginal heritage in or near the study area are discussed below. A summary of impacts is provided below in Table 13.

Table 13 Summary of potential archaeological impacts

AHIMS site no.	Site name	Significance	Type of harm	Degree of harm	Consequence of harm
52-5-0223	Boomberry Point 1	Low	Direct	Total	Total loss of value
52-5-0225	Elizabeth Point	Low	Direct	Total	Total loss of value
52-5-0642	Gilba Road 1	Low	Indirect	Partial	Partial loss of value
52-5-0643	Gilba Road 2 Fill	Low	Indirect	Partial	Partial loss of value

7.2 Management and mitigation measures

Ideally, heritage management involves conservation of sites through the preservation and conservation of fabric and context within a framework of 'doing as much as necessary, as little as possible' (Australia ICOMOS 2013). In cases where conservation is not practical, several options for management are available. For sites, management often involves the salvage of features or artefacts, retrieval of information through excavation or collection (especially where impact cannot be avoided) and interpretation.

Avoidance of impact to archaeological and cultural heritage sites through design of the development is the primary mitigation and management strategy, and should be implemented where practicable.

Boomberry Point 1 (AHIMS 52-5-0223) and Elizabeth Point (AHIMS 52-5-0225) are currently located within the proposed development area and impacts cannot be avoided. It is therefore recommended that an archaeological test excavation program be conducted within the vicinity of these two sites. Under Requirement 14 of the Code, test excavations within 50 metres of known or suspected shell midden sites are

not permitted without an AHIP. Due to the presence of AHIMS 52-5-0223 (Boomberry Point 1) within the study area and the proximity of one possible midden, AHIMS 52-5-0643 (Gilba Road 2 Fill 1), it will be necessary to apply for an AHIP to conduct test excavations.

Previous assessments, including a limited archaeological test excavation program conducted by Biosis (2010), identified an area of moderate subsurface archaeological potential within the study area. Further testing is therefore recommended in the area of moderate archaeological potential prior to development, to fully identify the nature and extent of Aboriginal occupation within the study area.

Legend

- Study area
- Proposed development
- AHIMS record

Figure 11 Proposed development with AHIMS

0 50 100 150 200

Metres
Scale: 1:4,000 @ A3
Coordinate System: GDA 1994 NSW Lambert

N

biosis

Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

Matter: 30437
Date: 21 October 2019,
Checked by: SJK, Drawn by: LW, Last edited by: amurray
Location:P:\30400s\30437\Mapping
30437_ACHA_F6_AHIMSDevelop

8 Recommendations

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the study area and influenced by:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter.
  - The Code.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: Application for an AHIP to conduct test excavations

Under Requirement 14 of the Code, test excavations within 50 metres of known or suspected shell midden sites are not permitted without an AHIP. Due to the presence of AHIMS 52-5-0223 (Boomberry Point 1) within the study area and the proximity of one possible midden, AHIMS 52-5-0643 (Gilba Road 2 Fill 1), it will be necessary to apply for an AHIP to conduct test excavations.

For information about AHIPs and their preparation, see below.

Advice preparing AHIPs

An AHIP is required for any activities likely to have an impact on Aboriginal objects or Places or cause land to be disturbed for the purposes of discovering an Aboriginal object. The EES issues AHIPs under Part 6 of the NPW Act.

AHIPs should be prepared by a qualified archaeologist and lodged with the EES. Once the application is lodged processing time can take between 8-12 weeks. It should be noted that there will be an application fee levied by the EES for the processing of AHIPs, which is dependent on the estimated total cost of the development project. Where there are multiple sites within one study area an application for an AHIP to cover the entire study area is recommended.

Recommendation 2: Discovery of Unanticipated Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the EES. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object, the archaeologist will provide further recommendations. These may include notifying the EES and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.

2. Notify the NSW Police and EES's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by EES.

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Appendices

Appendix 1 AHIMS results

E.1

FINAL TRAFFIC AND TRANSPORT ANALYSIS AND FINAL RESPONSE TO TRAFFIC AND TRANSPORT ISSUES

Our Ref: 8201714202 No:CA
Contact: Christos Apostolopoulos

9 September 2019

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Dear Michelle,

TALLAWARRA LANDS MIXED USE DEVELOPMENT (MP09_0131 MOD 1) – RESPONSE TO SUBMISSIONS
TRAFFIC IMPACT ASSESSMENT (8201714202, VERSION 4, 18 APRIL 2019) – RESPONSE TO COMMENTS

I refer to the above documentation and the letter received from the Department (your reference MP 09_0131 MOD 1) dated 25 July 2019. The letter has been reviewed and Cardno has prepared a response within this letter to respond to *Key Issue 5 – Road and Connectivity*. Other key issues identified in the letter have been addressed elsewhere.

The structure of the responses contained within this letter have been set up to be consistent with the letter provided by Roads and Maritime Services (RMS) to the Department dated 19 July 2019 (RMS reference STH09/01095/17).

Within this letter, RMS identified a number of outstanding concerns that required further clarification. The responses in the table below seeks to provide clarification/additional information as required to address these concerns.

RMS Comment

The modelling provided in the updated TIA appears to be based on 1,144 proposed lots. The submitted RtS details a lot yield of 1,310 proposed lots (although the figure of 1,320 is also used). It is unclear as to why there is a difference between the lot yields in the TIA and RtS. As such, RMS seeks clarification as to what the correct lot yield is and if the yield in the TIA is incorrect the associated modelling should be updated to reflect the correct yield.

Response

The modelling was based on the revised yield scenarios of 1,144 residential lots (northern and central precincts only) and 1,494 residential lots (all precincts combined). Since the completion of the modelling assessment, multiple revisions of layout plans for the Central and Northern precincts has occurred with the total number of residential lots ultimately defined at 1,251. The modelling reflective of 1,494 lots is therefore based on a conservative (higher) number of lots.

RMS Comment

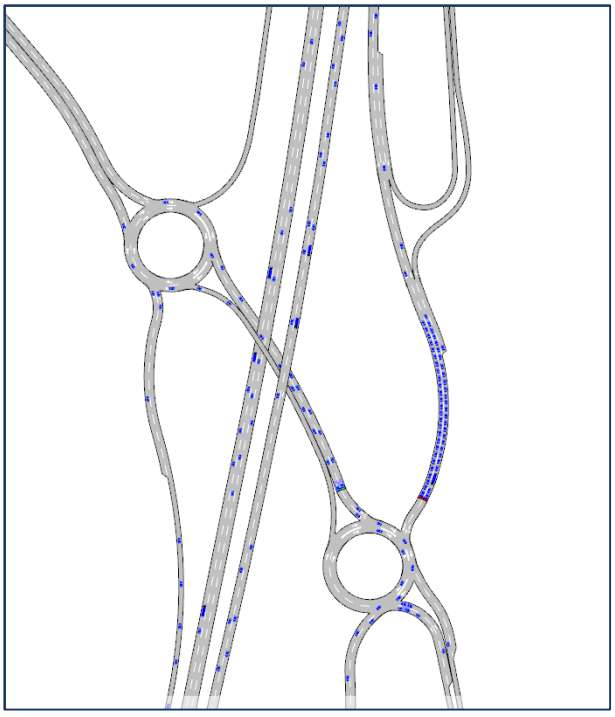
The modelling provided indicates that a Level of Service (Los) D will be provided in the AM and PM peak period for the southbound offload. This appears to be due to the fact that the TIA has not modelled a signalized roundabout (eastern roundabout) which RMS has determined is required in 2041. Refer to Attachment 2 for additional details;

Response

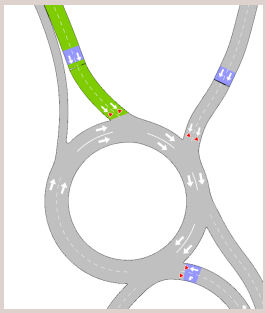
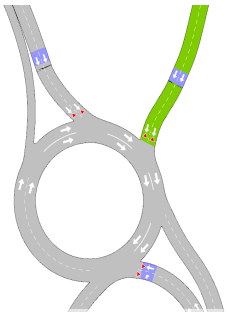
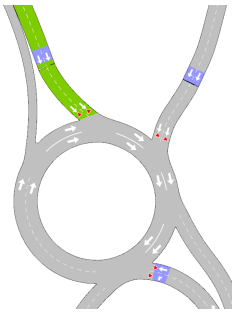
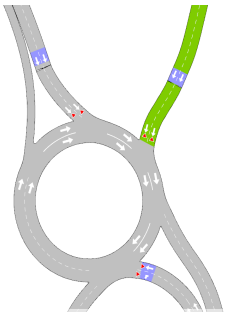
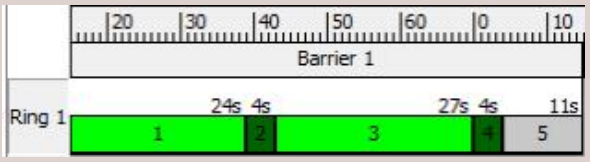
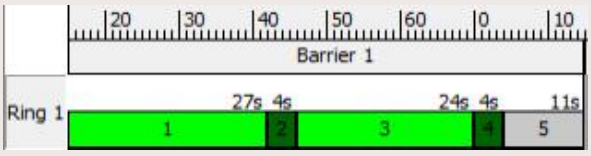
1. Roundabout Metering

Ramp metering has been implemented at the eastern roundabout (northern and western approaches). This is consistent with RMS APRB Design for Approval models.

RMS requires all intersections to operate at a LoS C or better. Revised signal phasing was tested for Scenario 6 (with 1,494 lots). This resulted in improved intersection performance at the eastern roundabout from LoS D to C. The actual signal operation is more likely to be based on vehicle actuation, therefore optimising the phasing arrangement at all times (based on traffic demand on each approach).



The summary below illustrates the signal timing changes (PM peak) applied at the eastern roundabout of the northern interchange:

Adopted APRB Design for Approval model signal timings *(also used in the traffic impact assessment report - Job reference: 8201714202, Version 4, dated 18 April 2019)*		***Revised signal timing operation***	
A phase	*B phase*	*A phase*	*B phase*
			
			

2. Off-Ramp LoS Calculation

The other model location showing a LoS D was the southbound exit ramp. Upon reviewing the LoS calculations adopted, it was found that capacity of 2000 pcus//hour was erroneously assumed (this capacity refers to segments with 1 lane). A capacity of 4000 pcus//hour should have been assumed (given the 2 lane layout at this location). The LoS calculation was revised and the LoS improved from D to B.

3. APRB Report Revision

The traffic impact assessment report (Job reference: 8201714202, Version 4, dated 18 April 2019) compared the intersection performance under Scenario 6 with the Albion Park Rail Bypass "Addendum Traffic and Transport Assessment Report revision 04". A new comparison with the most recent revision ("Revision 08") was undertaken as part of his response. A summary of all scenarios and comparisons is shown below.

Sce.	Model Used	Location	APRB Revision 04 (1,010 Lots)		APRB Revision 08 (1,010 Lots)		Previous Modelling Scenario 6 (1,494 Lots) TIA (8201714202) – 18 April 2019		Revised Modelling (1,494 Lots)*	
			AM	PM	AM	PM	AM	PM	AM	PM
6	2041 Design for Approval	Northbound Entry Ramp	A	A	A	A	A	A	A	A
		Northbound Exit Ramp	C	C	C	C	C	C	C	C
		Southbound Entry Ramp	C	B	C	C	C	C	C	C
		Southbound Exit Ramp	D	D	B	B	C	D	B	B
		Western Rdbt	A	A	A	A	A	A	A	A
		Eastern Rdbt	B	B	B	B	B	D	B	C

**including roundabout metering changes and off-ramp revised calculations*

RMS Comment

RMS disagrees with the conclusion in the TIA that a LoS D is ok. RMS' capacity requirement has always been a LoS C or better. As such, additional details are required on how the proposed development will provide a LoS C or better;

Response

Revised modelling shows LoS performance of C or better across all intersections and mid-block locations – see above.

RMS Comment

It is RMS' understanding that the current Tallawarra Lands Concept Plan approval requires the proponent to upgrade the Yallah Bay Road and Princes Highway intersection. RMS seeks confirmation that this still will be undertaken as part of the approved development. It is unclear to RMS how this intersection will be able to perform at a satisfactory LoS without some changes to its configuration. This should be modelled by the proponent with and required changes being clearly detailed;

Response

Yallah Bay Road / Princes Highway intersection performs at LoS C or better across all assessed scenarios (traffic signal installation at some scenarios has been proposed with existing layout geometry and a 2-phase signal operation)

RMS Comment

The increased traffic yield scenarios in the TIA have been modelled with a Haywood Bay link in place, whereas the scenarios within the approve development yield do not appear to have been. As such, any approval for an additional lot yield, as currently sought, should ensure that the Haywards Bay link/connection is provided and should not be deferred until the Lakeside/Southern Precinct is develop. Additional comments on the issue of 'Connectivity' are provided in a separate point below;

Response

It was discussed during a meeting with RMS on 9 Aug 2019 how a timeframe for the delivery of the road could not be imposed at this point in time. RMS highlighted the need for the road to be a crucial part of the development and to ensure provision of a road corridor between Tallawarra and Haywards Bay is preserved. During the meeting, it was agreed that no work would be done as part of the northern and central precincts that would preclude the delivery of this road corridor. This road corridor should be wide enough to accommodate the construction of a road category suitable for bus movements in both directions and sufficient space for a shared path.

RMS Comment

RMS is unclear as to how some of the Traffic Impact Assessment/Modelling issues detailed in its response dated 15 August 2018 have been addressed in the RtS and the updated TIA that has been submitted (refer to Attachment 3 – yellow highlighted sections).

> No traffic volume changes have been documented. The models provided assess the modified land use scenarios but nothing has been shown as to how this translated into volume increases across the network. RMS requires additional information to enable it to understand the volume changes resulting from the modification.

Response

Traffic flow plots comparing the old residential yield of 1,010 lots to the 1,494 lots scenario have been prepared and attached in Appendix A

RMS Comment

RMS is unclear as to how some of the Traffic Impact Assessment/Modelling issues detailed in its response dated 15 August 2018 have been addressed in the RtS and the updated TIA that has been submitted (refer to Attachment 3 – yellow highlighted sections).

> The Tallawarra Lands development, based on the information in the TIA, will generate an estimated 2,760 jobs (1,640 direct jobs and 1,121 indirect jobs – as noted in the TIA). Only direct jobs have been considered in the updated TIA. While it is noted that the TIA states that "indirect jobs would have been included in the overall regional employment growth applied in TRACKS for the 2026 and 2041 design horizon years", RMS requires confirmation that this was the case and if not, the modelling for this modification needs to be updated to reflect the traffic impacts for both the direct and indirect employment opportunities.

Response

The indirect jobs mentioned in the TIA have been spread throughout the background growth in regional jobs included in the future year models. Jobs in the future models were made up of specifically identified areas of job growth, mainly associated with the developments in Port Kembla, West Dapto, Calderwood, Tallawarra etc, and a general increase in jobs distributed throughout the model on a pro-rata basis to maintain a realistic employment to population ratio.

RMS Comment

RMS is unclear as to how some of the Traffic Impact Assessment/Modelling issues detailed in its response dated 15 August 2018 have been addressed in the RtS and the updated TIA that has been submitted (refer to Attachment 3 – yellow highlighted sections).

> The updated employment numbers show that in the northern precinct there will be 612 jobs (refer to Figure 3.5 – Employment Distribution revised). Noting that this precinct only contains residential lands and open space/environmental land with no employment lands it is unclear as to how the number of jobs shown in the northern precinct has been determined. RMS requires clarification;

Response

The figure of 612 jobs was derived from a vision that was created for the site b that included potential foreshore development works. To ensure that traffic modelling was conservative, this number of jobs was identified for the north shore precinct and used in the modelling. This has been done to ensure that future road works could cater for the possibility of foreshore job creation. Given the foreshore work may not occur it is assumed that the modelling is conservative and ensures flexibility in the future.

Yours sincerely,

Christos Apostolopoulos
Traffic Engineer
for Cardno
Direct Line: +61 2 9496 7735
Email: chris.apostolopoulos@cardno.com.au

Appendix A – Traffic Flow Plots

Appendix B – RMS Response to Submissions Letter

Appendix A

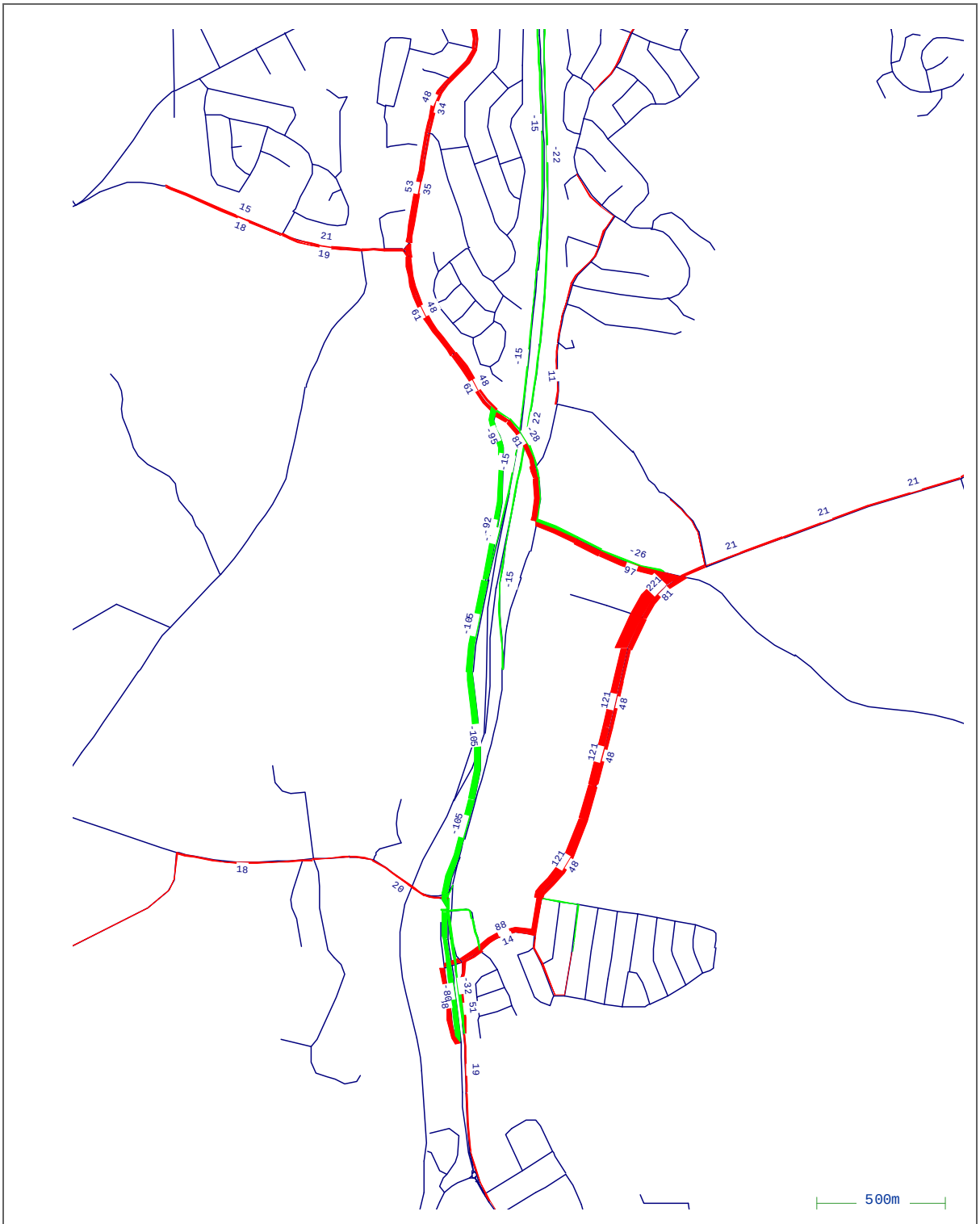
2041 AM Peak 1HR All Vehicle
Change in Flow – 1494HH Stage 2 vs 1144HH Stage 1

TDG now Stantec

1

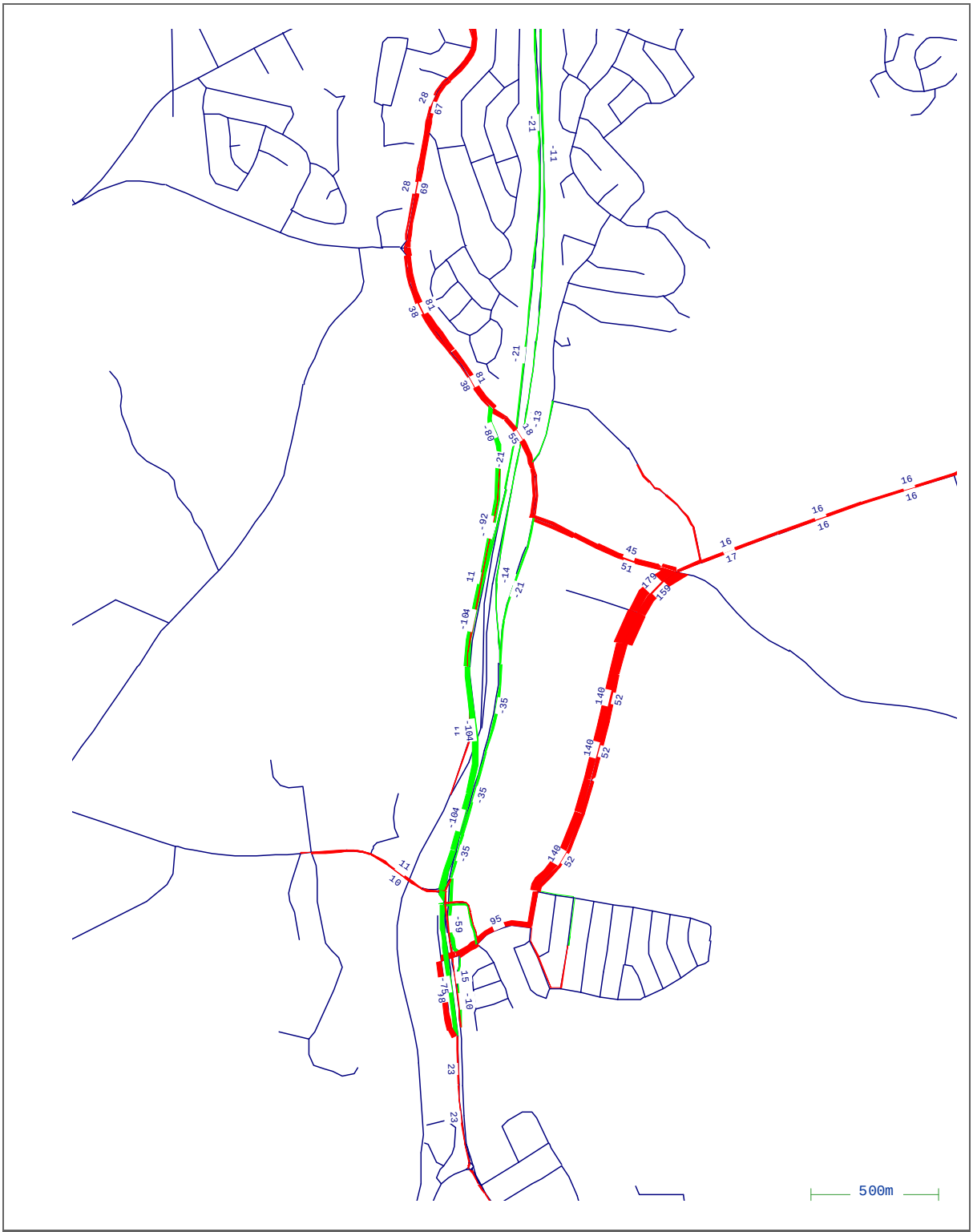
2041 PM Peak 1HR All Vehicle
Change in Flow – 1494HH Stage 2 vs 1144HH Stage 1

TDG now Stantec



2041 AM Peak 1HR All Vehicle – Detailed View
Change in Flow – 1494HH Stage 2 vs 1144HH Stage 1

TDG now Stantec



2041 PM Peak 1HR All Vehicle – Detailed View
Change in Flow – 1494HH Stage 2 vs 1144HH Stage 1

TDG now Stantec

Appendix B

Transport
Roads & Maritime
Services

Our ref: STH09/01095/17
Contact: Andrew Lissenden
Your ref: MP09_0131 MOD 1

19 July 2019

Michelle Niles
Senior Planner – Regional Assessments
NSW Department of Planning, Industry and Environment
BY EMAIL: information@planning.nsw.gov.au

TALLAWARRA LANDS MIXED USE DEVELOPMENT (MP09_0131 MOD 1) – RESPONSE TO SUBMISSIONS

Dear Michelle,

Roads and Maritime Services (RMS) refers to the proponents Response to Submissions (RtS) relating to the above modification that has been forwarded to RMS for comment.

RMS has reviewed the information provided and apologies for the delay in providing its formal comments. RMS' review has focused on the impact to the state road network. RMS as a result of its review/assessment notes the following:

- For this development, the key state road is the Princes Highway;
- The modification (as amended) seeks to:
    - Increase the density of development within the northern and central portion of the site (i.e. increase in the residential and industrial footprints as well as reduce the opens space, commercial and retail footprints);
    - Increase the maximum number of residential lots from 1,010 lots to 1,310 lots (previously the increase was to 1,480 lots). This to occur within the northern and central precincts;
    - Separate the northern and central precincts of the concept approval from the southern precinct; and
    - Amend a number of conditions some of which relate to infrastructure upgrades and state public infrastructure provision;
- RMS is currently undertaking works relating to the extension of the M1 Princes Motorway between Yallah and Oak Flats to bypass Albion Park Rail (i.e. the Albion Park Rail bypass project). Part of the extension works that are being undertaken adjoin the western boundary of the development site; and
- RMS has previously provided advice to the proponent's consultant Cardno on the proposed modification prior to its formal lodgement (RMS letter dated 14 September 2017). Advice has also been provided to the Department of Planning and Environment (DP&E) as part of the proposals public exhibition (RMS letter dated 15 August 2018 and email dated 11 September 2018).

Having regard for the above RMS advises that it still has concerns with the proposal as currently provided for comment. More detailed comments are provided in **Attachment 1** to this letter.

RMS again requests that the determination of the modification request not occur until the proponent has amended the current application to addresses the issues detailed in **Attachment 1**. This ensuring that the modification, if approved, has minimal impacts on the state road network and correctly reflects the works required to be provided by the developer as part of any future development applications lodged.

If you have any questions please contact Andrew Lissenden on 4221 2769.

RMS notes that Transport for NSW has provided separate comments to DP&E in relation to the submitted RtS in relation to bus routes, active transport infrastructure and public transport capable infrastructure.

Please ensure that any further email correspondence is sent to 'development.southern@rms.nsw.gov.au'.

Yours sincerely

Chris Millet
Manager Land Use
Southern Region

Cc: Michelle.Niles@planning.nsw.gov.au

- **Issues to be Addressed:**

  - *Traffic Impact Assessment/Modelling:* RMS from reviewing the updated *Traffic Impact Assessment* (TIA) prepared by Cardno (Job Ref: 8201714202, Version 04, dated 18 April 2019) provides the following comments:

    - The modelling provided in the updated TIA appears to be based on 1,144 proposed lots. The submitted RtS details a lot yield of 1,310 proposed lots (although the figure of 1,320 is also used). It is unclear as to why there is a difference between the lot yields in the TIA and RtS. As such, RMS seeks clarification as to what the correct lot yield is and if the yield in the TIA is incorrect the associated modelling should be updated to reflect the correct yield;
    - The modelling provided indicates that a Level of Service (Los) D will be provided in the AM and PM peak period for the southbound offload. This appears to be due to the fact that the TIA has not modelled a signalised roundabout (eastern roundabout) which RMS has determined is required in 2041. Refer to **Attachment 2** for additional details;
    - RMS disagrees with the conclusion in the TIA that a LoS D is ok. RMS' capacity requirement has always been a LoS C or better. As such, additional details are required on how the proposed development will provide a LoS C or better;
    - It is RMS' understanding that the current Tallawarra Lands Concept Plan approval requires the proponent to upgrade the Yallah Bay Road and Princes Highway intersection. RMS seeks confirmation that this still will be undertaken as part of the approved development. It is unclear to RMS how this intersection will be able to perform at a satisfactory LoS without some changes to its configuration. This should be modelled by the proponent with and required changes being clearly detailed;
    - The increased traffic yield scenarios in the TIA have been modelled with a Haywood Bay link in place, whereas the scenarios within the approve development yield do not appear to have been. As such, any approval for an additional lot yield, as currently sought, should ensure that the Haywards Bay link/connection is provided and should not be deferred until the Lakeside/Southern Precinct is develop. Additional comments on the issue of 'Connectivity' are provided in a separate point below; and
    - RMS is unclear as to how some of the Traffic Impact Assessment/Modelling issues detailed in its response dated 15 August 2018 have been addressed in the RtS and the updated TIA that has been submitted (refer to **Attachment 3** – yellow highlighted sections).

  - *Noise Mitigation:* As the average annual daily traffic (AADT) along the adjoining section of the Princes Highway is greater than 20,000 vehicles per day, RMS acknowledges that appropriate measures must be identified that will ensure noise levels as specified in Clause 102 of *State Environmental Policy (Infrastructure) 2007* are not exceeded. RMS from reviewing the updated Noise Assessment prepared by Pacific Environmental (Doc No. ACO-NSW-000-21909, Version I, dated 26.10.2018) still has concerns that the updated report only mentions treatment of future receivers by way of architectural treatment. There is no mention of considering noise walls which are preferred as they provide noise reduction for both the external and internal areas.

    In addition, concern is raised in regards to the mapped zones for acceptable areas (refer to Figure 8.1 in Section 8). The updated report shows a "Provisional Zone" (in orange) where mechanical ventilation and upgraded façade elements such as windows, doors and roof insulation may be required. It is however acknowledged that it does set the area where noise mitigation would be considered. RMS believes that the area shown is indicative only and as such some additional wording should be added to this figure advising that this zone is only indicative and that further investigation

would be required at the detailed design stage of Tallawarra Lands to determine the extent of the area where noise mitigation would be considered/required.

RMS maintains its position that the responsibility for noise mitigation lies with the developer when approval for the road project is determined prior to the approval for the construction of the dwelling (as is the current situation). As has been previously advised the approval for a sub-division is not enough to relinquish responsibility of noise mitigation for the developer. Only if the developer has approval for the construction of the dwelling prior to the determination of the road project then RMS would be responsible for mitigation and this would depend on the stage of construction for the dwelling. Noise mitigation by way of the hierarchy outlined in EPA's "*Road Noise Policy*" would be provided when the dwelling has already been constructed however in the situation where construction has not commenced then RMS' obligation is to provide at-source mitigation assuming a single storey residence (Practice Note 2 of RMS' "Environmental Noise Management Manual".

Having regard for the above the Albion Park Rail Bypass project would not be responsible for noise mitigation for the Tallawarra Lands Concept Plan Approval Modification. It is up to the determining authority/DP&E to ensure that the relevant requirements (e.g. *Development Near Rail Corridors and Busy Roads – Interim Guideline*) are adhered to.

- *Connectivity:* RMS notes that the RtS still seeks to separate the northern and central precincts from the southern precinct, which is currently owned by a different land owner, however forms part of the same major project approval.

  RMS maintains its objection to this split and that connectivity of the development, as approved, to Haywards Bay that adjoins the southern boundary of the site is vital to minimise local trips on the state road network. As such, from a network perspective it is important that this link is provided prior to the creation/registration of the neighbourhood centre land and industrial land which are employment generating and will provide services and employment opportunities to the communities that exist to the south (i.e. Haywards Bay). This connectivity ensuring suburbs are appropriately connected. Without this link, local trips between Haywards Bay and Tallawarra will need to be made via the Princes Motorway and Princes Highway which is considered inappropriate. Connected neighbourhoods are also desirable from a comprehensive bus network perspective and given the focus required on alternative modes of transport it is considered that this link should be provided as part of the creation of the employment lands in the central precinct. Given the proposed lot layout the majority of traffic that would use this link would be residential traffic rather than heavy vehicles as the commercial and industrial precincts have more convenient access to the freeway/highway. RMS does not accept the proponent's position that "*this road corridor will not be feasible until such time as the Lakeside precinct is developed (owned by Energy Australia).*" The proponents submission noting that at that the Tallawarra Lands development will provide a mix of services that will be required residents in Haywards Bay on a day to day basis as well as stating that Energy Australia representatives have confirmed that the development of their land (i.e. the southern/lakeside precinct) will not be in place by 2026 and most unlikely by 2041.

  Previous advice provided by RMS to both the proponent and DPE has detailed the RMS concerns on the non-provision of connectivity to/from Haywards Bay for vehicles (cars, buses, etc), pedestrians and cyclists. With the above advice on the timeframe for future development of the southern/lakeside precinct unlikely by 2041, the proposed non provision of the road link between Haywards Bay and the neighbourhood centre land, industrial land in the central precinct until after 2041 is not supported. RMS maintains that connectivity to Haywards Bay is vital to minimise local trips on the state road network.

- **Other General Comments:**
  - *Albion Park Rail Bypass:* As noted above RMS is currently undertaking works for the upgrade of the Princes Highway as per the planning approval that has been issued. A portion of these works occurring in the vicinity of the subject sites western boundary.

    Based on the information that has now been provided RMS is satisfied that the amended subdivision layout in the southwestern portion of the Central Precinct as detailed in the RtS (i.e. as shown in Figure 5.6 on Page 45 of the *Tallawarra Lands - Response to Submissions* prepared by Cardno Job Ref: 82017142-02, Version 5, dated 13 May 2019) has now been adjusted to have regard for the latest road boundaries for the Albion Park Rail bypass project. As such, no proposed lots and/or works associated with the proposed modified development appear to be in the area required by RMS for RMS Albion Park Rail bypass project. Noting the comments above it is recommended that any approval, when issued, is conditioned such that no works associated with the development are to occur within the Albion Park Rail bypass project boundaries (inclusive of the future Stage 3 Yallah Interchange) and must be wholly located outside the currently identified and required road reserve area as has been advised by RMS. This including, but not limited to, proposed local roads, bicycle paths, noise mitigation measures, landscaping works and infrastructure required to service the proposed development.
  - *Open Space/Landscape Plans:* RMS from reviewing the updated landscape plans prepared by Cardno (with reference Project No.82017142-02, Drawings L1002, L1003, L1006, Issue 4, dated 10.5.19) notes that land in the vicinity of the sites western boundary that is affected by the Albion Park Rail Bypass is no longer shown as containing tree planting and bicycle path linkages or identified as open space lands that are being provided to service the proposed development. As such, RMS raises no concerns with the amended plans that have been submitted with the RtS. It is however recommended that any approval, when issued, is conditioned such that no works associated with the development are to occur within the Albion Park Rail bypass project boundaries (i.e. new tree planting, bicycle path linkages, noise attenuation, etc).
  - *Amendments to Conditions:* As per RMS' previous advice (RMS letter dated 15 August 2018), it is noted that the current modification still seeks to amend the requirements of Conditions 15, 16 and 25 of the concept approval. On the basis that the comments above under the dot point 'Issues to be Addressed' can be satisfactorily addressed the following comments are provided:
    - *Condition 15 - Upgrade of the junction of the Princes Highway and Yallah Bay Road to a roundabout:* This modification seeks to amend the requirements of Condition 15 to provide clarity on when the design for the upgrade of the junction of the Princes Highway and Yallah Bay Road to a roundabout is required. RMS raises no objection with the proponent's proposal to amend the timing of the design to be required in connection with the future subdivision of the Central Precinct and not as part of the DA for superlot subdivision;
    - *Condition 16 - Requirements for a Concept Design for the Closure of Cormack Avenue:* This modification seeks to amend the requirements of Condition 16 to provide clarity on when the design for the closure of Cormack Avenue is to be provided. RMS raises no objection with the proponent's proposal to amend the timing of the design so it is required in connection with the future subdivision of the Central Precinct and not as part of the DA for superlot subdivision; and
    - *Condition 25 - Satisfactory Arrangements for the provision of designated State public infrastructure:* The modification seeks to amend the requirements of Condition 25 so as to enable the lodgement of a DA for superlot subdivision that "*does not include any physical works or subsequent applications*" prior to satisfactory arrangements for the provision of designated State public infrastructure in accordance with Clause 6.1 of WLEP 2009 being demonstrated. Subject to

the land within the development site that is required for the Albion Park Rail Bypass project being identified as a separate lot on any superlot subdivision plan that is lodged for the central precinct and written approval being obtained from RMS prior to registration of the superlot for the central precinct confirming that sufficient land has been provided for the works required for the Albion Park Rail Bypass project, RMS raised no objection.

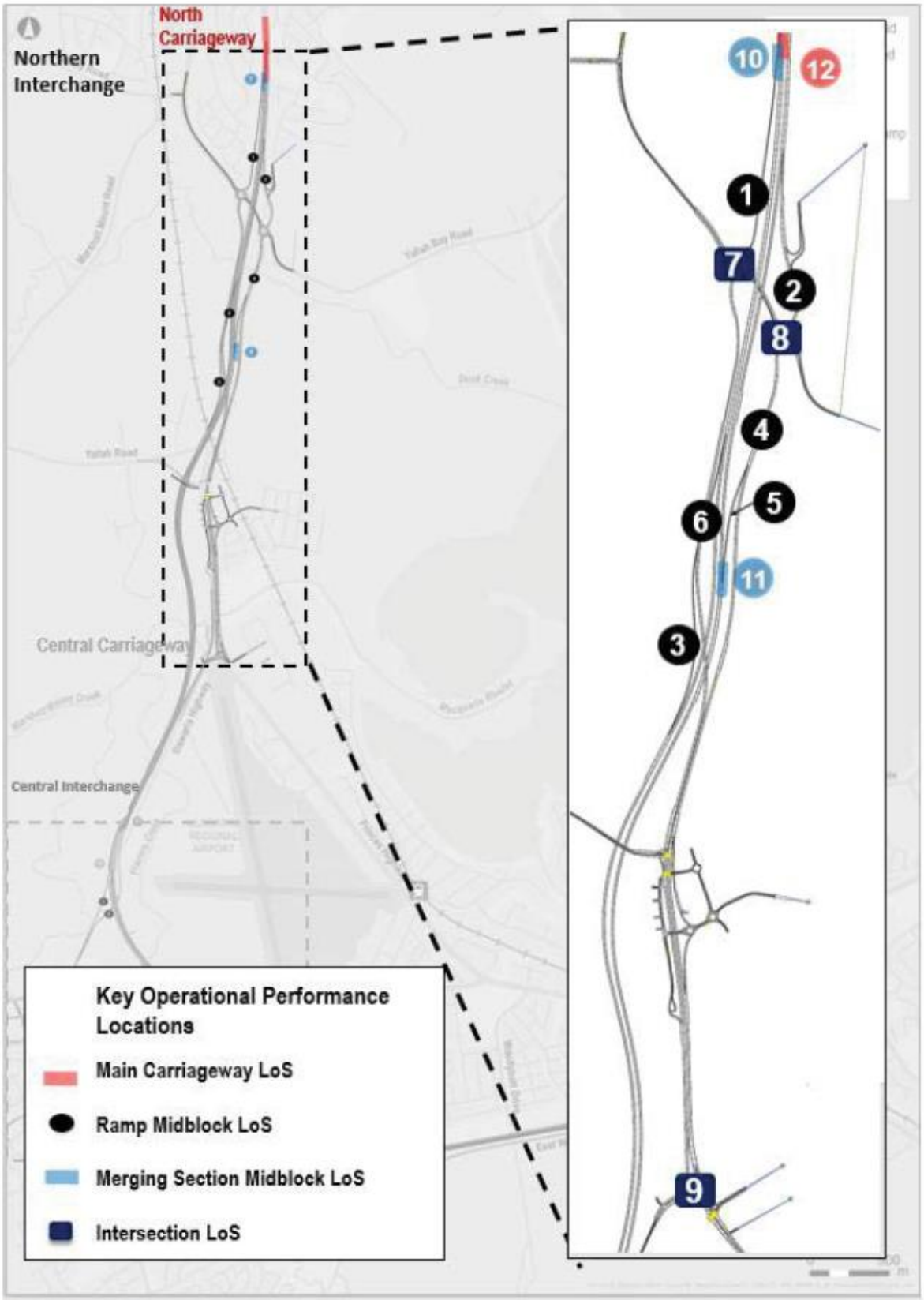


Figure 5-7 Northern Interchange Performance Locations

Table 5-4 and Table 5-5 summarise the results for the Northern interchange in the 2041 Aimsun model in comparison with the 2041 EIS results.

This is 'C' in the updated Traffic Report submitted which is a change from current.

Table 5-4 Northern Interchange Performance Results – AM Results

ID	Location		EIS		Current Design	
Ramp Midblock Level of service		**No. of lanes**	**LoS**		**LoS**	
1	Northbound entry ramp	1	A		A	
2	Southbound exit ramp	1	C		B	
3	Northbound exit ramp	1	B		C	
4	Southbound entry ramp	1	A		C	
5	Southbound entry ramp	1	-*		B	
6	Northbound exit ramp	1	C		C	
Intersection Level of service		**Type**	**Average Delay (seconds)**	**LoS**	**Average Delay (seconds)**	**LoS**
7	Western roundabout	Roundabout	11	A	13	A
8	Eastern Roundabout	Signalised	17	B	25	B
9	Illawarra Highway / Princes Hwy	Roundabout	7	A	15	B
Merging Section Level of Service			**LoS**		**LoS**	
10	Northbound entry ramp		B		C	
11	Southbound entry ramp		C		B	
Main Carriageway Sections Midblock LoS			**LoS**		**LoS**	
12	North		Northbound: C Southbound: C		Northbound: C Southbound: B	

Source: Aimsun Model (2016).

* This ramp location has been changed equivalent performance results not comparable to the EIS

This is 'D' in the updated Traffic Report submitted which is concern for RMS.

Table 5-5 Northern Interchange Performance Results – PM Results

ID	Location		EIS		Current Design	
Ramp Midblock Level of service		**No. of lanes**	**LoS**		**LoS**	
1	Northbound entry ramp	1	A		A	
2	Southbound exit ramp	1	C		B	
3	Northbound exit ramp	1	B		B	
4	Southbound entry ramp	1	B		C	
5	Southbound entry ramp	1	-*		B	
6	Northbound exit ramp	1	C		C	
Intersection Level of service		**Type**	**Average Delay (seconds)**	**LoS**	**Average Delay (seconds)**	**LoS**
7	Western roundabout	Roundabout	12	A	11	A
8	Eastern Roundabout	Signalised	22	B	26	B
9	Illawarra Highway / Princes Highway	Roundabout	7	A	11	A
Merging Section Level of Service			**LoS**		**LoS**	
10	Northbound entry ramp		B		B	
11	Southbound entry ramp		C		C	
Main Carriageway Sections Midblock LoS			**LoS**		**LoS**	
12	North		Northbound: B Southbound: D		Northbound: C Southbound: C	

Source: Aimsun Model (2016).

RMS assumed this was a signalised roundabout in 2041 and as a result RMS has 'B' not 'D' as contained in the updated Traffic Report submitted.

* This ramp location has been changed equivalent performance result

The midblock performance of the ramps (ID 1-6) all operate at an adequate LoS C or better in both AM and PM peak periods.

The merging sections (ID 10 and 11) on the motorway for the northbound and southbound entry ramps operate at LoS C or better in both peak periods.

The eastern roundabout at the Northern interchange (ID 8) is forecast to operate at LoS B in both AM and PM peak periods, with an average delay of 25 seconds in the AM peak hour and 26 seconds in the PM peak hour.

Ramp metering has been implemented at this roundabout on the northern and western approaches to allow sufficient opportunity for Yallah Bay Road traffic to exit. As shown in Table 5-6, all approaches perform at LoS C or better. It is anticipated that this metering will be further considered and refined at detailed design, including consideration of delaying the implementation of metering until it is necessary.

Noting the concerns above, RMS requests that the plans submitted (e.g. Figures 3.1, 3.4, 3.5, 5.3, etc) are updated to clearly show the current Albion Park Rail bypass project boundaries so as to demonstrate that all works proposed and required as part of this concept approval are wholly located outside the currently identified/required road reserve area (e.g. local roads, bicycle paths, noise mitigation measures, etc).

- *Traffic Impact Assessment/Modelling:* RMS from reviewing the Traffic Impact Assessment (TIA) prepared by Cardno (Job Ref: 8201714202, Version 02, dated 8 September 2017) provides the following comments:

  - No traffic volume changes have been documented. The models provided assess the modified land use scenarios, but nothing has been shown as to how this translated into volume increases across the network. RMS requires additional information to enable it to understand the volume changes resulting from the modification;
  - The Tallawarra Lands development, based on the information in the TIA, will generate an estimated 2,760 jobs (1,640 direct jobs and 1,121 indirect jobs - as noted in the TIA). Only direct jobs have been considered in the updated TIA. While it is noted that the TIA states that "*indirect jobs would have been included in the overall regional employment growth applied in TRACKS for the 2026 and 2041 design horizon years*", RMS requires confirmation that this was the case and if not, the modelling for this modification needs to be updated to reflect the traffic impacts for both the direct and indirect employment opportunities;
  - The updated employment numbers show that in the northern precinct there will be 612 jobs (refer to Figure 3.5 – Employment Distribution revised). Noting that this precinct only contains residential lands and open space/environmental land with no employment lands it is unclear as to how the number of jobs shown in the northern precinct has been determined. RMS requires clarification;
  - By 2041 there are some Level of Service (LOS) changes as well as intersection capacity issues, particularly in the PM peak at the northbound offload to Princes Highway (LOS B to E). LOS B was with the original approved 1010 lot residential yield. LOS E/F was with the full modified 1494 lots at 2041. RMS notes that this intersection was sensitive to volume changes when the APRB models were being worked on. RMS also notes that this may require an intersection upgrade to roundabout or signals if northern interchange is not built. RMS requires details on any proposal as part of this modification to make improvements at this intersection to ensure it operates at a satisfactory level;

E.2

RMS EMAIL CONFIRMING NOISE ATTENUATION SATISFACTORILY ADDRESSED

Adam Clarke

From:	Con Tsitsos <Con.TSITSOS@rms.nsw.gov.au>
Sent:	Thursday, 31 October 2019 8:05 AM
To:	Adam Clarke
Cc:	Aaron Mckenzie; Andrew Lissenden
Subject:	RE: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18) [Filed 31 Oct 2019 08:20]

Hi Adam,

Happy with the proposal from Aaron.

Regards,

Con Tsitsos
Environment Officer
Environment | Safety, Environment and Regulation
T 02 8843 3065 **M** 0408 629 893
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Every journey matters

Roads and Maritime Services
Level 3, 27 Argyle Street, Parramatta NSW 2150
PO Box 973 Parramatta NSW 2124

From: Adam Clarke [mailto:adam.clarke@cardno.com.au]
Sent: Thursday, 31 October 2019 7:34 AM
To: Aaron Mckenzie; Con Tsitsos
Subject: RE: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

Hi Con

We are looking to re-submit to the Department. Can you confirm you are happy with what Aaron has proposed below?

Regards

Adam Clarke
MANAGER - CIVIL INFRASTRUCTURE - PROJECT DELIVERY
CARDNO

Phone +61 2 4231 9600 Fax +61 2 4228 6811 Direct +61 2 4231 9629
Address Ground Floor, 16 Burelli Street, Wollongong, New South Wales 2500 Australia
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CONNECT WITH CARDNO

From: Aaron Mckenzie <Aaron.Mckenzie@erm.com>
Sent: Friday, 25 October 2019 4:07 PM
To: Con Tsitsos <Con.TSITSOS@rms.nsw.gov.au>
Cc: Adam Clarke <adam.clarke@cardno.com.au>
Subject: RE: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

HI Con

Following our discussion earlier this week, see below proposed text to be included in the submission clarifying the approach for managing noise impacts from the Princes Hwy on the proposed Tallawarra Lands development.

To ensure road traffic noise impacts from the Princes Highway do not adversely impact future residents on the western boundary of the central precinct further noise assessment would be undertaken at allotment design and DA approval stage. This would include:

- *Noise modelling of highway noise impacts (taking into account approved highway upgrade alignment and future traffic volume growth) on the allotment layout design taking into account proposed landform geometry and positioning of dwellings.*
- *Receiver noise levels assessed with reference to the Road Noise Policy Criteria (EPA 2011) and relevant RMS road noise modelling and mitigation guidelines*

Noise modelling of the allotment design will inform the need for mitigation such as noise barriers and/or architectural treatments to achieve external and internal noise criteria.

Trust this mitigates RMS concerns.

Kind regards

Aaron McKenzie
Principal Consultant

ERM
309 Kent St, Sydney, NSW 2000
Direct (02) 8584 8804 | **Mobile** 0422 701 300
E aaron.mckenzie@erm.com | **W** www.erm.com

ERM *The business of sustainability*

From: Con Tsitsos <Con.TSITSOS@rms.nsw.gov.au>
Sent: Tuesday, October 15, 2019 4:31 PM
To: Aaron Mckenzie <Aaron.Mckenzie@erm.com>

Cc: Adam Clarke <adam.clarke@cardno.com.au>
Subject: RE: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

Thanks Aaron.

Regards,

Con Tsitsos
Environment Officer
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Every journey matters

Roads and Maritime Services
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PO Box 973 Parramatta NSW 2124

From: Aaron Mckenzie [mailto:Aaron.Mckenzie@erm.com]
Sent: Tuesday, 15 October 2019 4:23 PM
To: Con Tsitsos
Cc: Adam Clarke
Subject: RE: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

HI Con,

I am tied up tomorrow and Friday, lets aim for Monday, I will send a meeting invite to lock it in.

Kind regards
Aaron

From: Con Tsitsos <Con.TSITSOS@rms.nsw.gov.au>
Sent: Tuesday, October 15, 2019 1:41 PM
To: Aaron Mckenzie <Aaron.Mckenzie@erm.com>
Cc: Adam Clarke <adam.clarke@cardno.com.au>
Subject: RE: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

Hi Aaron,

I am tied up this afternoon and all day Thursday. I'm good for tomorrow afternoon or Friday afternoon. If not then Monday is also fine.

Regards,

Con Tsitsos
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Every journey matters

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PO Box 973 Parramatta NSW 2124

From: Aaron Mckenzie [mailto:Aaron.Mckenzie@erm.com]
Sent: Tuesday, 15 October 2019 10:07 AM
To: Con Tsitsos
Cc: Adam Clarke
Subject: FW: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

Hi Con

Possible to line up a discussion regarding the Tallawarra Lands Project?

As a starting point I have availability this afternoon or possibly Thursday morning

Kind regards

Aaron McKenzie
Principal Consultant

ERM
309 Kent St, Sydney, NSW 2000
Direct (02) 8584 8804 | **Mobile** 0422 701 300
E aaron.mckenzie@erm.com | **W** www.erm.com

From: Adam Clarke <adam.clarke@cardno.com.au>
Sent: Thursday, October 3, 2019 8:29 AM
To: Aaron Mckenzie <Aaron.Mckenzie@erm.com>
Subject: FW: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

Hi Aaron

Further to our discussion last week, see correspondence below from RMS re Noise Walls. Can you please try and contact Con and document outcomes so we can provide to RMS in an updated submission?

Thanks again for your help.

Regards

Adam Clarke
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From: Andrew Lissenden <andrew.lissenden@rms.nsw.gov.au>
Sent: Thursday, 3 October 2019 8:10 AM
To: Adam Clarke <adam.clarke@cardno.com.au>
Cc: Sophie Perry <sophie.perry@cardno.com.au>; Michelle Niles <Michelle.Niles@planning.nsw.gov.au>
Subject: Tallawarra Lands Submission to DPIE (MP 09_0131 MOD 1) - RMS Interim Comments (Your Ref: 82017142-01:SP, RMS Ref: STH09/01095/18)

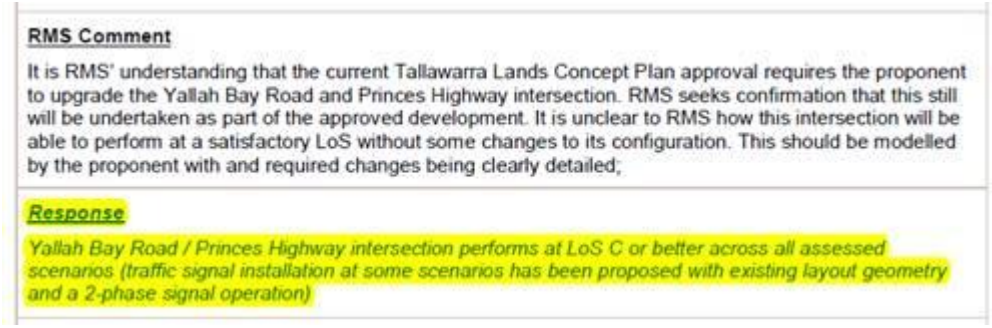
Hi Adam,

Thanks for your email below and the subsequent phone discussion that was had on 27 September 2019. Please be advised that Roads and Maritime Services (RMS) has reviewed Cardno's letter dated 13 September 2019 (with associated attachments) and provides the following interim comments noting that the NSW Department of Planning, Industry and Environment (DPI&E) is yet to formally refer the additional submission to RMS for comment. In summary, the additional information provided does not provide enough information to address some of the concerns previously raised. As such, RMS requests the submission of additional information so as to ensure the matters outlined below are addressed and can be closed out:

- *Noise:* RMS' submission dated 19 July 2019 identified a concern with noise mitigation issues. As discussed in the subsequent meeting had on 9 August 2019 at the RMS offices in Wollongong, Cardno's noise consultant was going to contact Con Tsitsos (RMS Environmental Officer – 8843 3065) to discuss the noise concerns raised and to ensure this issue is addressed and as such the future subdivision would provide and can accommodate any potential noise mitigation measures required (e.g. noise walls). Details of the outcomes from the above discussion were to be provided in the updated submission that has now been provided. A review of the latest submission has failed to locate any details on this discussion and how the noise mitigation concerns that have been raised by RMS will be adequately addressed to RMS' satisfaction. RMS therefore requests that a discussion be had with Con Tsitsos and agreement reach in relation to noise issues with updated details being provided (e.g. details of the discussion, details on how the concerns will be resolved as part of the development, etc).

- *Cormack Avenue Closure:* RMS notes that the original documentation lodged for MP 09_0131 Mod 1 (i.e. Cardno Report with Job Ref: 82017142-02, dated 13 May 2019, Version 5) sought to amend Condition 16 of the issued approval in relation to the closure of Cormack Avenue so the design is submitted with the first application for development in the Central Precinct (not with the Super lot Subdivision application) and the road closure implemented with the development of the Central Precinct. RMS seek confirmation that Cormack Avenue is still to be closed as part of the development of the Central Precinct as well as confirmation that any required works will completed prior to the issue of a subdivision certificate for the smaller residential lots in the central precinct where dwelling entitlements will be created.

- *Intersection Of Yallah Bay Road/Princes Highway:* RMS notes that Appendix E of the Cardno letter dated 13 September 2019 (refer to extract below) infers that the intersection of Yallah Bay Road and the Princes Highway will be traffic signals not a roundabout. The RMS design for the Albion Park Rail Bypass for the northern interchange and specifically this intersection is a roundabout. This being consistent with the design and modelling information that RMS has provided access to for the Albion Park Rail Bypass project as well as the infrastructure approval that has been issued by DPI&E for the same project. RMS seeks clarification on what intersection treatment the submission has indicated will be provided at the Yallah Bay Road and the Princes Highway intersection.



RMS Comment

It is RMS' understanding that the current Tallawarra Lands Concept Plan approval requires the proponent to upgrade the Yallah Bay Road and Princes Highway intersection. RMS seeks confirmation that this still will be undertaken as part of the approved development. It is unclear to RMS how this intersection will be able to perform at a satisfactory LoS without some changes to its configuration. This should be modelled by the proponent with and required changes being clearly detailed;

Response

Yallah Bay Road / Princes Highway intersection performs at LoS C or better across all assessed scenarios (traffic signal installation at some scenarios has been proposed with existing layout geometry and a 2-phase signal operation)

Please note that the above are interim comments as a result of an initial review of the Cardno submission. A formal response will be provided to DPI&E once an updated submission is formally referred to RMS for comment. Should you have any further questions in relation to the above please give me a call.

Regards

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From: Adam Clarke [mailto:adam.clarke@cardno.com.au]
Sent: Wednesday, 18 September 2019 10:26 AM
To: Andrew Lissenden; Development Southern
Cc: Sophie Perry; Klaude Lania (Klaude.Lania@bridgehill.com.au)
Subject: Tallawarra Lands: Submission to DPEI

Hi Andrew

As discussed at our meeting a few weeks back we were to provide updated documentation to RMS at the same time we lodged with the department. I meant to send this link to you Monday but time got away.

Link below contains the full submission. Any issues with access, please let me know.

https://fileshare.cardno.com/wl/?id=K2IIcq3pfqkcAU2UdRO8n72YH64r8nXr

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APPENDIX

F

RESPONSE TO NON-KEY ISSUES RAISED BY AGENCIES FROM SECOND ROUND OF CONSULTATION

APPENDIX F - Summary RTS Second Round of Submissions

Submissions have been received from:

Wollongong City Council (WCC)

NSW Environment Protection Agency (EPA)

NSW Office of Environment and Heritage (OEH) (now Department of Energy, Environment and Sustainability DEES)

Sydney Water (SW)

Transport for NSW (TfNSW)

Roads and Maritime Service (RMS).

The following matrix summarises the issues raised in submissions by specific assessment matters:

	Strategic Planning	Contamination	Heritage	Flooding	Water Quality	Transport/ Traffic	Noise	Visual	Utilities/ Services	Social Planning/ Open Space
WCC	X	X	X	X		X		X		X
EPA		X					X			
OEH/ DEES			X	X	X					
SW									X	
TfNSW						X				
RMS	X					X				

9.2 Detailed Comments List by Agency

Organisation	Comment	Response
	Strategic Planning	
WCC	"*Council would like to reiterate its ongoing concerns regarding the extent of additional residential development proposed under the modification. Whilst the number of additional lots sought has dropped, there remains an almost a 30% increase in residential development outcomes in a land release area where the primary focus was on employment lands*."	The percentage change in residential land use is not a reasonable measure of the strategic benefits of the Concept Approval to deliver new land uses. The Concept Approval seeks to optimise the future use of the entire in a manner which is compatible with creation of new employment lands and

		protection of the existing power plant site and opportunities for the power plant expansion. The total number of new residential lots in the original Concept Approval was 1,010. The modification application proposes 1,257 new residential lots. The total change in residential land area is mostly the result of undergrounding power lines in the Northern Precinct. There are multiple benefits from undergrounding the electricity infrastructure including improvements in visual amenity and the ability to provide a continuous ecological corridor along the southern edge of the Northern Precinct from the lake foreshore to Mount Brown. Lot sizes and densities have been improved consistent with objectives for housing variety in: - Illawarra Shoalhaven Regional Plan. - Draft West Dapto Urban Release Area - Low Rise Medium Density Housing Code. The primary focus for the Concept Approval remains a mix of land uses. The total area of Neighbourhood Centre land in the Central Precinct has been reduced from 5.38 hectares to 4.75 hectares due to the need for an open space buffer to the western edge separating the Neighbourhood centre from land reserved for the Albion Park Rail Bypass (APRB). The diversity of employment lands has been maintained with the inclusion of both IN1 General Industrial and IN2 Light Industrial land use zones. The total area of industrial lands in the Central Precinct has been increased slightly from 14.25 hectares to 14.65 hectares. The reduction in the total area of employment lands is a result of increasing buffer separation from residential land, improving the continuity of environmental corridors to the western and northern edges of the industrial lands in the Central Precinct and accommodating for land dedicated to the APRB. There is a reduction in the land uses that have potential to generate employment in the Southern (Lakeside) Precinct as a consequence of existing Condition B1 Part B – Modifications which requires the primary school and retirement living areas to be deleted. ***This matter is considered to have been addressed and resolved.***
WCC	*"Commentary provided by the applicant indicates that they see the solution to addressing potential land use conflicts as being the restriction of industrial uses to benefit the proposed residential development. This approach is not considered to be*	Council originally supported light industrial (IN2) as a buffer to General Industrial (IN1) in its letter dated 31 July 2018. Specifically Council's comments were as follows: "*Council could support the proposed change to the zoning of industrial land from IN1 to IN2 in the central precinct.*

	satisfactory, as residential development should only be permitted where it does not threaten the viability of industrial or employment lands. *Additionally, the application documentation indicates that the proposed buffer area is located within the industrial lands, subsequently limiting their use. There is sufficient supply of residential land within the nearby West Dapto Urban Release Area -Council maintains that any buffers or restrictions required to facilitate the proposed development should be provided within the residential zones."*	*The proposed change to zoning to address potential future impacts from industrial development on surrounding residential development is appropriate in this instance. However, it is noted that the proposal also increases the industrial land footprint such that there is a much reduced buffer proposed between the industrial land and residential footprint. The proposed buffer is considered to be insufficient and Council considers that the previous buffer should be retained.*" WLEP 2009 lists the following objectives for all development in Zone IN2: *"To minimise any adverse effect of industry on other land uses"* Light industrial uses are to contain impacts within the site in order to be consistent with this objective. It is not the intention of the IN2 land use zone to require buffers on adjoining non-industrial land. Conditions of development consent specific to any future land use within the IN2 zone will be expected to control and contain detrimental impacts within the site. The approved Statement of Commitments requires future industrial development applications to incude measures to contain impacts within the site. It is not feasible, practical or possible to install a spatial buffer on residential land to accommodate for any possible externalities from nearby industrial land due to the diversity of potential future uses and the need to control detrimental impacts at the source subject to development consents for any future land use. There are many examples of light industrial land immediately adjacent to residential land in WLEP 2009 such as Woonona, Russell Vale, Corrimal, Bellambi, Towradgi, North Wollongong, Coniston and Warrawong. The final version of the modified Concept Plan increases the width of the buffer area of environmental lands between the residential lots and land in Zone IN2 (see Appendix A). The buffer does not limit the future use of industrial lands and allows for continuity between the future riparian lands and environmental lands with associated ecological benefits. The total area of industrial zoned land in the Central Precinct under the original Concept Approval is 14.25 hectares. The total area of industrial lands in the final version of the Concept Plan is 14.65 hectares. The viability and efficient use of proposed industrial lands will not be compromised by the layout of land uses in the modified Concept Plan. ***This matter is considered to have been addressed and resolved.***

WCC	*"It is clear that the proposed modification can only progress at the expense of employment lands, and as such, Council considers the modification to be contrary to the intent behind the original Concept Plan approval by failing to give due regard to the importance of scarce employment lands."*	The modification is not contrary to the intent to deliver a range of land uses that suitably protect the long term operational viability of the power station. Some land uses with potential to generate employment in the Southern Precinct (retirement and school) were required to be deleted by the conditions of the Concept Approval and are not a consequence of the modification application. The buffer between industrial and residential lands has been improved as previously requested by Council with a network of environmental lands and despite the precedent elsewhere in the WLEP 2009 of residential land adjoining IN2 land. ***This matter is considered to have been addressed and resolved.***
Environment / Contamination		
WCC	*"Council does not support the applicant's proposed changes to the wording of conditions 11 and 12. The following wording (in italics) is considered by Council to appropriately reflect the desired delivery of the condition requirements if the Department is of a mind to support the modification request:* **11 -** Further Investigation of the Areas of Environmental Concern and engagement of a Site Auditor accredited under the Contaminated Land Management Act 1997 Future applications that include works on those lands nominated as Areas of Environmental Concern (AECs) in the Coffey Environments report (December 2010) must be accompanied by a further environmental assessment report. In addition to adopting the recommendations contained in Section 12 of the Coffey Environments Groundwater Modelling Assessment report, the further investigations must consider: ▪ the potential for contaminants present in the soil and groundwater in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, Duck Creek and ultimately to the receiving waters of Lake Illawarra, and measures to address this including the feasibility of remediation of contaminated soils and/ or the containment of the sources of contamination; ▪ measures to ensure that the environmental attributes of conservation lands on the site are not adversely impacted on by contaminants present in the soil and groundwater; ▪ recommendations for the ongoing management of contaminated groundwater; ▪ the potential for the contamination present in soil and groundwater in the vicinity of the ash ponds to adversely affect groundwater dependent ecosystems on the site; and ▪ any risks to human health or the environment.	Council's comments are not compatible with the anticipated transfer of land, the first future superlot subdivision and the anticipated practical sequence of works. Contamination conditions are addressed by EPA comments and response below. Seek modification as proposed. Site investigations and RAP to be completed for all lands. RAP to recommend spatial sequence of remediation. Remediation will require a time frame that exceeds Superlot DA lodgement due to monitoring timeframes. Remediation can be achieved prior to the issue of DAs for subdivision other than superlot DA Council's suggestion is intended to: ▪ achieve DSI and RAP prior to the issue of any Construction Certificate; and ▪ site auditor statement prior to the issue of any Subdivision Certificate. As explained in Section 1.6 to the Key Issues letter – the recommended modifications to Conditions 11 and 12 will meet WCC requirements. ***This matter is considered to have been addressed and resolved.***

	Following the completion of the further investigations, the proponent must engage a Site Auditor accredited under the Contaminated Land Management Act 1997 to verify the adequacy of the investigations (and any proposed remediation). *Prior to the issue of any construction certificate the proponent must undertake Stage - II (detail Site Investigation) and Stage III (Remediation Action Plan) for the entire area including Southern Precinct as stated in Tallawarra Lands Concept Plan. Prior to submission of Stage II and III reports, these reports must be reviewed by appointed site auditor.* Prior to issue of any Subdivision Certificate (other than for super lot subdivision), *the proponent must obtain a Site Auditor Statement which certifies that the site is suitable for its proposed use. No buildings may be erected on the land prior to the issue of a Site Auditor Statement certifying that the site is suitable for its proposed use.* **12 -** Engagement of a site auditor to verify the adequacy of asbestos soil sampling and asbestos contamination investigations The first future application to Council (refer to Condition A6) must include a verification from a Site Auditor accredited under the Contaminated Land Management Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by Douglas Partners (July 2010) and any further investigations subsequently undertaken by the proponent and certification that the site can be made suitable for the proposed use. *Prior to issue of any Subdivision Certificate* (other than for super lot subdivision)*, the proponent must obtain a Site Auditor Statement which certifies that the site is suitable for its proposed use. No buildings may be erected on the land prior to the issue of a Site Auditor Statement certifying that the site is suitable for its proposed use."*	
EPA	"*Subdivision of Residential Precincts - While a holistic approach to contaminated site assessment of the Tallawarra Lands is preferred, EPA does not object to separating the residential areas into 2 broad groups as proposed by the Proponent. That is separating the Northern and Central precincts (as 1 group) from the Southern precinct. To ensure ongoing site contamination is managed holistically and efficiently, further divisions resulting in separate or piecemeal progression of contamination requirements are unlikely to be supported by the EPA*."	See Item 1 in Table 1-1 to the Key Issues letter. ***This matter is considered to have been addressed and resolved.***
EPA	"Completion of Contamination Sampling and Site Assessment - The remaining site contamination assessments investigations for the Areas of Environmental Concern (as listed in Condition 11) and asbestos (Condition 12) must be completed prior to the submission of any DA for subdivision development."	See Item 2 in Table 1-1 to the Key Issues letter. ***This matter is considered to have been addressed and resolved.***
EPA	Accredited Site Auditor Report on Contamination Sampling and Site Assessment - Any submission of a subdivision DA must be supported by a report from an NSW EPA Accredited Site Auditor which confirms the adequacy of the contamination investigations	See Item 3 in Table 1-1 to the Key Issues letter. ***This matter is considered to have been addressed and resolved.***

	and any remediation action plan and certifies that that the site/s can be made suitable for the proposed use.	
EPA	Remediation - Any remediation required must coincide with the first earthworks breaking of ground. This may include clearing or infrastructure installation. This must be in advance of any dwelling construction.	See Item 4 in Table 1-1 to the Key Issues letter. ***This matter is considered to have been addressed and resolved.***
EPA	Site Auditor Statement - Prior to any dwelling construction the Proponent must submit a NSW EPA Site Auditor Statement validating that any remediation has been completed as necessary and the site is suitable for the proposed use.	See Item 5 in Table 1-1 to the Key Issues letter. ***This matter is considered to have been addressed and resolved.***
Heritage		
WCC	*"1. The Heritage Impact Assessment Report prepared by Biosis should be amended to reflect the substantial additional historical records available through historical newspaper articles relating to property transactions to ensure that the conclusions made about potential archaeological sites are properly considered. The HIS should be updated to reflect the addition historical investigations that BIOSIS has undertaken and include clear archaeological significance and context mapping."*	A supplementary letter was prepared by Biosis that confirms articles were considered in the revised Heritage Impact Assessment. See the Biosis letter dated 19 October 2018 in Appendix H. Furthermore these articles will form part of the reference list to the CHMP to be submitted with the first future superlot subdivision application as required by Condition This matter is also addressed in Section 2.5 above and requested modification to Condition 8. ***This matter is considered to have been addressed and resolved.***
WCC	*"The modification to the concept plan appears to provide for an expansion of the potential heritage impacts on both Aboriginal and non-Aboriginal heritage sites, and would result in further encroachment of the development into areas higher on the development site. These additional impacts do not appear to be consistent with the aims and intentions of the earlier considerations relating to the development of the Tallawarra Lands and are generally not supported on heritage grounds."*	The adjustments to the Central and Northern Precinct development footprints and the further investigations triggered by these adjustments are explained in Section 2 above. As discussed with DEES (OEH), the required testing, consultation, AHIP and CHMP requirements will be fulfilled in accordance with the requested modifications to Condition 8 and on the clear understanding there will be no site disturbance associated with the first future superlot subdivision. ***This matter is considered to have been addressed and resolved.***
WCC	"*The Central Precinct subdivision layout should allow for the Fig Tree associated with AHMS site (52-5- 0614) to be retained. All future development within the Central Precinct should be suitably tailored to limit impacts upon the tree and to ensure its ongoing viability*."	This matter has been addressed in Section 2.4 of the Key Issues letter. ***This matter is considered to have been addressed and resolved.***

WCC	*"The concept plan should be undertaken in accordance with the recommendations of the final reports titled -Archaeological Report: North Precinct and Archaeological Report: Central Precinct prepared by BIOSIS in August 2017."*	The modified Concept Plan is consistent with these reports including the adjustment to the boundaries of the Central Precinct to provide clearance from PAD 52-5-0523. These reports are anticipated to be included in the Reference List to the CHMP to be submitted with the first future superlot subdivision application to ensure all future DAs are consistent with the CHMP. This is also addressed with the requested modification to Condition 8 as discussed in Section 2.5 of the Key Issues letter. ***This matter is considered to have been addressed and resolved.***
WCC	"*Further archaeological testing should be undertaken in the areas identified as having moderate archaeological potential as recommended by BIOSIS in the 2017 ACHAR and in the PAD3 area before finalisation and approval of the concept plan modification. This is essential to properly understand, measure and consider impacts.*"	This matter has been discussed in detail in Section 2 of the Key Issues letter. As discussed with DEES (OEH), the required testing, consultation, AHIP and CHMP requirements will be fulfilled in accordance with the requested modifications to Condition 8 and on the clear understanding there will be no site disturbance associated with the first future superlot subdivision. ***This matter is considered to have been addressed and resolved.***
WCC	"*The comments of the Office of Environment and Heritage should be sought in relation to the revised proposal and the applicant should be required to obtain an AHIP under the NSW National Parks and Wildlife Act 1974 for the impacts on the Aboriginal sites for impacts to sites Boomberry Point and Elizabeth Point (25-5-0223 and 52-5-0225) in the Northern Precinct as well as (52-5-0613), (52-5- 0614), (52-5-0615) and PAD 3 (52-5-0523).*"	This matter has been discussed in detail in Section 2 above. As discussed with DEES (OEH), the required testing, consultation, AHIP and CHMP requirements will be fulfilled in accordance with the requested modifications to Condition 8 and on the clear understanding there will be no site disturbance associated with the first future superlot subdivision. Specific to this matter, the CHMP will address the management of impacts on the Aboriginal sites of Boomberry Point and Elizabeth Point (25-5-0223 and 52-5-0225) in the Northern Precinct as well as (52-5-0613), (52-5- 0614), (52-5-0615) and PAD 3 (52-5-0523). There will be no impacts on these items with the first future superlot subdivision as there are no works or change of land use proposed at this stage. The CHMP will be submitted with the first future superlot subdivision and every subsequent DA will be consistent with the CHMP. ***This matter is considered to have been addressed and resolved.***

WCC	*"A Heritage Management Plan should be developed for the site as recommended in detail by the NSW Heritage Council in their referral on the original proposal."*	A CHMP will be required by modifications to Condition 8 as described in Section 2.5 of the Key Issues letter. ***This matter is considered to have been addressed and resolved.***
WCC	*"A Heritage Interpretation Plan should be required to be developed by the applicant and the recommendations and outcomes of this should be incorporated in any future development of the site. The plan should provide for the interpretation of both the Aboriginal and European history of the site and any significant sites/features identified within it. It should also ensure that Aboriginal objects are managed appropriately through further consultation with the local Aboriginal Community. Consideration should be given to planning for an on-site Keeping Place for removed objects. The plan should also be informed by the additional historical records Council holds from newspaper references related to the property."*	A CHMP will be required by modifications to Condition 8 as described in Section 2.5 of the Key Issues letter. The CHMP will be developed in consultation with Registered Aboriginal Parties. All available reference material will be included in the preparation of the CHMP and reference to Council's records is noted for inclusion in the CHMP. ***This matter is considered to have been addressed and resolved.***
OEH	"*We provided comments on 26 July 2018 in relation to the proposed Major Project modification. These comments remain relevant. Archaeological technical reports have been provided with the Response to Submissions (RtS), however, these reports do not include the recommended archaeological test excavation*."	Further testing is in progress as detailed in Section 2.2 to the Key Issues letter. As stated in Section 2 to the Key Issues letter, AHIP and CHMP details will be submitted with the application for the first future superlot subdivision as no site disturbance will occur prior to this time. This process is consistent with the advice and requirements clarified at a meeting with DEES on 14 August 2019. Testing results and site management methods will be resolved prior to any works proposed for the site. ***This matter is considered to have been addressed and resolved.***
OEH	"*Updated Aboriginal cultural heritage assessment reports (Biosis 2017a and b) have been provided with the outcomes of the Aboriginal community consultation process. Biosis (2017a, p.27 and 2017b, 0.26) report that the Registered Aboriginal Parties (RAPs) support the draft reports. Comments were received recommending reburial of excavated Aboriginal objects and regarding the cultural context of the land.* *The Aboriginal cultural heritage assessment must also consider any changed impacts as a result of changes to the impact footprint (including any ancillary works) through this Modification since the Aboriginal heritage assessment was completed.* *The key issues for the Aboriginal cultural heritage assessment are:* ▪ *Aboriginal cultural heritage conservation and open space conservation should be further considered.*	Consistent with OEH recommendations, an AHIP and CHMP will be prepared for approval with the first future superlot subdivision application. This is "pre-approval" as required by OEH's comment. RAP consultation is in progress as details in Section 2.2 to the Key issues letter and the final form of the AHIP and CHMP will account for the final versions of precinct boundaries and conceptual layouts as proposed with this modification. ***This matter is considered to have been addressed and resolved.***

	▪ *The timing of the additional archaeological investigation - we recommend this is pre-approval.* ▪ *Timing of preparing the Aboriginal heritage management plan (AHMP) - we recommend this is prepared pre-approval."*	
OEH	"*No Aboriginal heritage conservation outcomes are proposed. The RtS states that the applicant cannot commit to the conservation of the fig tree recorded as Aboriginal cultural heritage site 52-5-0615. The argument presented (Cardno p.64) is that earthworks may be required 'in the vicinity of this tree to achieve the approved Concept Plan'. The applicant suggests further detailed studies at the development application stage.* *Appropriate evidence has not been presented about why this heritage item cannot be conserved. This modification application is an opportunity to amend the proposed earthworks near the tree and build a conservation outcome into the Concept Plan*."	See Section 2.4 to the Key Issues letter for details on this matter. ***This matter is considered to have been addressed and resolved.***
OEH	"*The RtS (section 5.12, pp.63-64) indicates that the recommended archaeological test excavation have not yet been conducted. Without the test excavation results the full impact of the proposal on Aboriginal heritage is not known. Early assessment provides the best opportunity to achieve heritage conservation and provides certainty to all parties about the Aboriginal heritage management requirements.* *We also support preparing the AHMP at an early stage of the project development, ideally before project approval. The AHMP must be prepared in consultation with the RAPs.* *Completing the test excavation and AHMP before project approval may reduce the complexity of the Aboriginal heritage approvals process at the DA stage.*"	See Section 2 to the Key Issues letter. The provision of an AHIP and CHMP at the time of lodgement of the first superlot subdivision application will ensure the appropriate controls will be in place before the approval for any site disturbance. This will meet the requirements of OEH and the statutory and procedural requirements for the potential approval of any works prior to those works commencing. ***This matter is considered to have been addressed and resolved.***
OEH	*"The RtS does not respond to concerns raised in submissions from the general public and the Lake Illawarra Estuary Management Committee about the loss of open space and associated educational opportunities for the Aboriginal community. These matters should be addressed.* *We encourage the applicant to engage those Aboriginal community members who have provided comments, and who have cultural knowledge relevant to the project area, in the consultation process required by OEH. We reiterate our previous comment that the proponent should ensure consultation about this project is continuous. In general, breaks of more than 6 months may not constitute continuous consultation."*	The reduction in open space is a consequence of land reserved for the Albion Park Rail Bypass and is not in the vicinity of land identified as being of moderate or high potential for Aboriginal cultural and heritage significance. Consultation with RAPs is ongoing having recommenced as indicated in Section 2.2 to the Key Issues letter. Outcomes of consultation will inform any future AHIP and the CHMP. Potential educational opportunities are expected to be addressed in the CHMP and made available for public exhibition during the advertising and notification of the development application for the first future superlot subdivision. ***This matter is considered to have been addressed and resolved.***

Flooding and Stormwater		
WCC	*"The proposed modification to the Industrial Employment Precinct in the Central superlot results in the proposed road and industrial lot being directly within the location of the existing watercourse. The proposed development would appear to be proposing industrial lots or the road way (other than bridging of a watercourse} within an area of high flood risk precinct and high hydraulic hazard area. This is contrary to the objectives of Chapter E13 of the Wollongong DCP 2009 and clause 7.3 of the Wollongong LEP 2009. The development should be redesigned such that all proposed roads and lots (other than recreation uses} are located wholly outside the areas of high flood risk (either high hydraulic hazard or 10m from top of bank). It is recommended that the industrial precinct be relocated back to the north east away from the watercourse*."	As explained in Section 4 above the location of the active public recreational space and playing fields within the Central Precinct is the same as that approved with the original Concept Plan and Concept Approval. Existing Condition 4 in Schedule 3 requires a Flood Risk Assessment and Management Plan to be submitted with the first future superlot subdivision application. A site-specific DCP submitted with the first future superlot subdivision application will identify the areas of high flood risk and high hydraulic hazard and ensure the location and finished surface levels for industrial lots and roads are compatible prior to the submission of future DAs for any works. The VMP required by existing Condition 10 in Schedule 4 will need to be compatible with the Flood Risk Assessment and Management Plan and will also need to be submitted with the first future superlot subdivision DA. This will need to demonstrate a new top of bank for the drainage depression in the Central precinct. These existing conditions are adequate to address Council's concerns. ***This matter is considered to have been addressed and resolved.***
WCC	*"Shared paths proposed in watercourse areas should be designed to ensure overtopping/inundation in lower order storm events does not occur, limiting the potential for debris build up and ongoing maintenance."*	As explained in Section 4 above, existing Condition 4 in Schedule 3 requires a Flood Risk Assessment and Management Plan to be submitted with the first future superlot subdivision application. The VMP required by existing Condition 10 in Schedule 4 will include the location of shared paths in relation to the top of bank of future watercourses and will need to be compatible with the Flood Risk Assessment and Management Plan. The VMP will also need to be submitted with the first future superlot subdivision DA. These existing conditions are adequate to address Council's concerns. ***This matter is considered to have been addressed and resolved.***
OEH	"*The Technical Memorandum provided by Cardno (2019) as part of the Response to Submissions (RtS) does not address comments relating to isolation and accessibility for emergency services during floods. As noted in the Tallawarra Lands Flood Risk Assessment (Bewsher, 2010), the access road into the northern precinct is expected to be inundated during a 1 % Annual Exceedance Probability (AEP) flood.*	Access and egress for emergency vehicles at this conceptual level is not proposed to be modified in comparison to that already approved. Condition 4 in Schedule 3 to the Concept Approval required a Flood Risk Assessment and Management Plan (FRAMP) to be submitted with the first future superlot subdivision application. The FRAMP will determine

	Accessibility during floods greater than this and up to the Probable Maximum Flood (PMF) does not appear to have been assessed, nor have the implications to the safety of an increased population as proposed in the modification. *We suggest that the DPE liaise with council to determine whether the modification is appropriate in the context of council's current and future flood access strategy and associated emergency response arrangements to manage risks to public safety in the event of a flood.*"	the 1% AEP flood, the PMF and the implications for the safe future use of the site. These details will be included in a site-specific DCP. Subject to detailed analysis in the FRAMP, a stay in place strategy for occupants could be recommended as the length of inundation is expected to be reasonably short. Emergency vehicle access and egress routes will be further defined with the FRAMP. No further information is considered necessary for the assessment and determination of this modification application. ***This matter is considered to have been addressed and resolved.***
OEH	*"In terms of comments raised with respect to the potential impacts of increased magnitude, frequency and volume of flows associated with the proposed modification, the RtS proposes that this be assessed in future design stages. This may have implications to the current approval and as such DPE should consider whether this is an appropriate approach in the absence of an assessment supporting a mitigation strategy.*"	The site-specific DCP will require no net change to the pre- and post-development flows as well as the management of overland and stormwater flows throughout the site in a manner to be approved by Council for inclusion in the DCP. This must be resolved with the assessment and determination of the first future superlot subdivision application. The site-specific DCP and its supporting documents will make refinements to the future development concept prior to the approval for any works or change to land use on the site. It is therefore appropriate for these potential impacts to be addressed with the first future superlot subdivision development application. ***This matter is considered to have been addressed and resolved.***
Water Quality		
OEH	"*Whilst we acknowledge that additional water quality modelling has been undertaken that reflects the intensification of the proposed modification, the additional information does not identify how the proposal will impact estuary health. The water quality assessment has not been prepared in accordance with the NSW Government's Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning decisions (the Framework). The assessment also does not identify how the residual stormwater pollutant loads discharging to Lake Illawarra as a result of the proposal, will impact the receiving waters of Lake Illawarra. In this regard, the impacts of the proposed modification on estuary health including water quality, coastal wetlands and aquatic ecosystems have not been assessed or modified mitigation strategies determined.*"	This matter is addressed in detail in Section 3 to the Key Issues letter. The Framework is most appropriately applied at the time of preparation of a site-specific DCP. This allows for Council and the community to evaluate whether the water quality targets and treatment methods are acceptable. It is unreasonable and impractical to require additional assessment or mitigation strategies at this stage. ***This matter is considered to have been addressed and resolved.***
OEH	"*The draft Lake Illawarra Coastal Management Program, 2018 (CMP) identifies that the most significant threat to the estuary health is catchment development and associated impacts to water quality. To address the threats and pressures on Lake Illawarra and to facilitate an improvement to long term estuary health, several key objectives and*	The original documentation for this modification was submitted to the department January 2018, prior to the Draft Lake Illawarra Coastal Management Program.

	management strategies are detailed within the draft CMP. The information detailed within the RtS does not consider the objectives of the draft CMP. Similarly, the Illawarra Shoalhaven Regional Plan (ISRP) identifies priority strategic goals and actions to promote and foster sustainable growth and the protection of the region's natural resources. Goal 5 - A Region that Protects and Enhances the Natural Environment under the ISRP is relevant to the proposal which has also not been considered. These strategic documents identify current priority threats and pressures to Lake Illawarra and objectives for managing estuary health, which provide a basis for assessing the impacts of the proposed modification and to integrate mitigation strategies. *Application of the Framework and consideration of the CMP and IRSP is appropriate for assessing water quality and the impacts from the proposal to the sensitive receiving waters and estuary health of Lake Illawarra. This approach will assist in identifying relevant water quality objectives, suitable stormwater water quality improvement infrastructure and other mitigation measures*."	The Draft Lake Illawarra Coastal Management Program has been exhibited by both Wollongong Council and Shellharbour Council between 31July and 11 September. Many submissions have been received to date and it will be some time before the Program is considered for adoption. However, it is anticipated the Program may be adopted prior to the lodgement of the first future superlot development application. Therefore the Program can be considered in the preparation of the stormwater management strategy to be included in the site-specific DCP. As mentioned above and in Section 3 to the Key Issues letter, the site-specific DCP is the most appropriate time for water quality targets, stormwater management and monitoring to be assessed and adopted. This matter is adequately addressed by existing conditions of the Concept Approval. No further detail is considered necessary for the assessment and determination of this modification application. ***This matter is considered to have been addressed and resolved.***
Transport and Traffic		
WCC	"*The increased yield traffic scenarios have been modelled with the Haywards Bay Link in place, whereas the scenarios within the approved development yield were not. It is therefore considered that any approval for additional yield should include a condition for the Haywards Bay Link to be provided*."	See Appendix E which contains revised modelling based on the final version of the modification and concept layout for critical intersections. Notwithstanding that this modification application relates to fewer residential lots than the approved Concept Plan, the Haywards Bay link remains an essential element of the overall Tallawarra lands development program. This matter is resolved in detail in Section 5 of the key issues letter above. ***This matter is considered to have been addressed and resolved.***
WCC	*"RMS will need to monitor development progress in order to ensure adequate capacity and acceptable main road network operation, especially in relation to the northbound M1 Dapto off-ramp and timing of Stage 3 (northern interchange) of the Albion Park Rail Bypass project."*	See Appendix E which demonstrates appropriate monitoring and Level of Service measures to the satisfaction of RMS. ***This matter is considered to have been addressed and resolved.***
TfNSW	"*As mentioned in prior correspondence dated 09/09/2018 (Ref: CD18/05593), there are currently no regular bus services operating in the Tallawarra Lands vicinity. The Traffic Impact Assessment identifies modifications to existing bus routes to service the proposed development. These modifications may adversely impact the existing customer base.*	Existing and Proposed Bus Networks are included in **Appendix A** and demonstrate simple loop services extending from existing services. The recommendation to consult Premier Illawarra with future development applications is noted and can be addressed at the

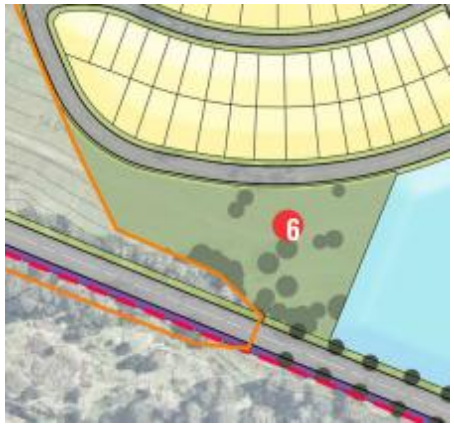
	The Proponent should consult the local bus operator, Premier Illawarra, in future development application stages to discuss the proposed modifications to the existing bus routes and explore any alternative servicing strategies, subject to demand and funding."	appropriate time. This matter does not prevent assessment and determination of the modification of the Concept Approval. ***This matter is considered to have been addressed and resolved.***
TfNSW	*"The RTS states the provision of walking and cycling paths are intended to form a connected network combining on-road, road verge and off road pathways. It is noted the NSW Planning Guidelines for Walking & Cycling (2004) and Wollongong City Council – Bicycle Plan support the inclusion of a cycleway along the north-south connector towards Howards Bay and on the east-west collector road.* *The Proponent should demonstrate in future development application stages that road reserve widths allow for adequate provision for foot, shared paths and cycle ways where supported."*	The Road Hierarchy and provision of active pathways will be resolved with the site-specific DCP to be submitted with the first future superlot subdivision application. All subsequent development applications for works will need to demonstrate consistency with the DCP. The recommendation for reference to *NSW Planning Guidelines for Walking & Cycling (2004) and Wollongong City Council – Bicycle Plan* is noted and can be addressed at the appropriate time. This matter does not prevent assessment and determination of the modification of the Concept Approval. ***This matter is considered to have been addressed and resolved.***
TfNSW	"*TfNSW has released the Guidelines for Public Transport Capable Infrastructure in Greenfield Sites which can be found at: https://www.transport.nsw.gov.au/industry/transport-planning-resources#Guidelines_for_Public_Transport_Capable_Infrastructure_in_Greenfield_Sites. The Guideline addresses the road network design and road infrastructure requirements for greenfield sites so that public transport can be successfully delivered.* *The Proponent should demonstrate at the development application stage that the detailed design of roads within the subject site is consistent with the Guidelines for Public Transport Capable Infrastructure in Greenfield Sites.*"	The Road Hierarchy and provision of public transport routes will be resolved with the site-specific DCP to be submitted with the first future superlot subdivision application. All subsequent development applications for works will need to demonstrate consistency with the DCP. The recommendation for reference to *Guidelines for Public Transport Capable Infrastructure in Greenfield Sites* is noted and can be addressed at the appropriate time. This matter does not prevent assessment and determination of the modification of the Concept Approval. ***This matter is considered to have been addressed and resolved.***
RMS	For all issues raised in the RMS letter dated 19 July 2019 see Appendix E	For a response to all issues raised in the RMS letter dated 19 July 2019 see Appendix E and Section 5 to the main letter. ***All matters are considered to have been addressed and resolved.***
Noise		
EPA	*"In our previous submission on this proposal of 16 August 2018 (our reference DOC18/584828), EPA raised concerns over the proposed residential precinct encroachment into previously established noise buffer zones and the assessment of low frequency noise from the operational power stations.*	EPA's letter acknowledges noise contours have been appropriately accommodated in the modified conceptual layout. No additional information is needed. ***This matter is considered to have been addressed and resolved.***

	This Response To Submissions report includes an updated Noise Impact Assessment (NIA) which addresses the above EPA concerns as follows: ▪ *The lot boundaries in the Northern Precinct now follow the modelled 40 decibel (A-weighted) (dBA) contour. This contour is listed in the Tallawarra B power station approval and establishes a noise buffer zone for power station operations. This amendment to the lot boundaries means that no residential development is now proposed in the existing buffer zone.* ▪ *A correction for low frequency noise is now included in the NIA and in combination with the updated lot boundaries, addresses EPA's concerns regarding low frequency noise.* *A key consideration is the prevention of noise related land use conflicts. A range of approaches to promote better noise outcomes include, but are not limited to the following:* ▪ *Reducing impacts at receivers through best practice design, siting, construction and operation.* ▪ *Implementing communication mechanisms to inform members of the public moving into noise-affected areas.* ▪ *Acoustic design input into planning controls such as the Subdivision Plans, Construction Certificate Plans and Specifications.* ▪ *Validation could also be required prior to the issue of an Occupation Certificate to ensure any acoustic design measures have been satisfactorily incorporated into the development as a further check and balance."*	
Visual		
WCC	"*The updated photomontage illustrates that the roofs of dwellings remain visible from the narrow strip of foreshore facing north-northeast and Oak Flats Boat Ramp. Council considers that no roofs should be visible from either vantage point by ensuring that maximum roof heights do not exceed the crest of the ridgeline*."	The visual impact assessment has not been updated to account for the extensive canopy tree planting within the ridgeline park of the Northern Precinct. Furthermore, building envelopes and building materials and finishes will be included in the site-specific DCP for dwellings on elevated land and dwellings on the large residential lots in the Central precinct to protect visual and scenic qualities. The modification proposes undergrounding of the high voltage power cables. This change will dramatically improve the visual quality of the Northern precinct area considered to be of much higher value than the mentioned rooftops. ***This matter is considered to have been addressed and resolved.***

Utilities/ Water Services		
Sydney Water	"*Last year, the consultant for the developer Bridgehill contacted us indicating - instead of 300 lots in the northern precinct as reported earlier, now there may be an increased yield of up to 540 lots. Sydney Water has carried out further hydraulic analysis and advised that up to 475 dwellings may be connected to our existing wastewater networks for initial developments in the northern part of Tallawarra without any trunk infrastructure delivery, and without the upgrading of storage capacity at SP0308 (sewage pumping station).*"	The final conceptual layout indicates 403 lots for the Northern Precinct. This is within the available capacity identified by Sydney Water. ***This matter is considered to have been addressed and resolved.***
Sydney Water	"*Further development beyond 475 lots cannot occur until Sydney Water carries out future planning and storage upgrade (capacity) at SP0308, and deliver other required trunk works to service middle and south precincts in the future. That project is on hold pending future demand for water related services. We deliver works based on demonstrated service demand.* *At least they can now proceed to service up to 475 lots through s73 process with local lead in and reticulation pipe extension at development stage. We will however need to see the proponent's design and accompanying flow schedule with extensions sized to serve a fully developed upstream catchment (ie. The full 540 plus any other development in the Precinct), and able to drain the full area – though we can support servicing of development up to 475 dwellings based on our current hydraulic analysis*."	Development can be staged and designed in consultation with Sydney Water to ensure sufficient supply. Any future development application for subdivision can only be granted consent if Wollongong Council is satisfied it is compliant with *Clause 7.1 Public Utility Infrastructure* to WLEP 2009.
Social Planning / Open Spaces / Public Benefits		
WCC	"*Council has continuing concerns around the lack of documentation that provides justification for the proposed reduction in open space and environmental lands in the central precinct. Council does not support the reduction of these lands to enable the expansion of the residential and industrial lands footprint.* *Whilst the applicant states that the SEARS did not require the preparation of a Social Impact Assessment, the modification proposes a significant increase in residential lot yield, even at the revised numbers. Council considers that open space should not be decreased unless there is justification for the same by way of a community/social infrastructure needs assessment or similar appropriate planning study detailing the amount of community use land required to accommodate the future Tallawarra Lands population. (Northern Precinct)*"	Council's estimation of the change in land areas is incorrect in two ways: (i) The reduction in 'open space and environmental lands' in the Central Precinct is a direct consequence of RMS request to set aside land for the Albion Park Rail Bypass corridor. (ii) The loss of 'open space and environmental lands' is not the result of an increase in residential and industrial land areas. Council's comments are also incorrect in referring to an "*increase in residential lot yield*". The total number of residential lots has decreased from 1,257 to 1,310. The variety of lot sizes in the conceptual layout has increased. The potential diversity of housing is consistent with the objectives of the ISRP and the Medium Density Housing Code and represents best practice in planning to increase diversity and choice of housing. As stated above, the increase in the total residential land area is mostly the result of undergrounding the HV power lines in the Northern Precinct

		which has significant environmental and visual benefits as well as improving connectivity and efficient layout. The concept plan for the ecological corridor along the southern edge of the Northern Precinct is superior to the previous approved Corkery Consulting Landscape Plan in providing a larger corridor and more continuous planting of canopy trees and shrubs and a more continuous link from the foreshore to Mount Brown. The key criteria for the delivery of open space in greenfield development are listed in the Department of Planning's 'Recreation and Open Space Planning Guideline (2010)' and the Government Architects 'Better Placed' (2017) and the 'Everyone Can Play Guideline' (DPE 2018). The key criteria are not defined by quantity and ratios but by access and connectivity, distribution, size and shape, quality, diversity and quantity (number of spaces rather than hectares). In addition to the open space and environmental lands proposed, there is potential for embellishment and restoration of the lake foreshore in accordance with a future VPA. Although the foreshore is outside the Tallawarra Lands boundary it will add to the useable open space and environmental lands accessible to future residents and enhance the quality of life for residents and visitors on local and regional scales. In summary the Concept Approval as modified represents potential delivery and enhancement of open space and environmental lands in a manner superior to the original Concept Approval. ***This matter is considered to have been addressed and resolved.***
WCC	**Northern Precinct** *"Road widths should accommodate two directional flow and on-street parking along the entire frontage of the foreshore and be wide enough to accommodate buses servicing the foreshore area. (Northern Precinct)."*	The road hierarchy plan in **Figure 5-7** of **Appendix A** shows the full length of the foreshore road as a Collector Road – Minor with a width of 20.4m suitable for two way traffic, on-street parking and buses. The Figure titled 'Proposed Bus Network' in **Appendix A** demonstrates the extension of Bus Route 33 can follow a loop service with a route along the foreshore road. Further details will be resolved with a future application for subdivision of the Northern Precinct. Road width and hierarchy will be included in the site-specific DCP to be submitted with the application for the first future superlot subdivision. ***This matter is considered to have been addressed and resolved.***

WCC	**Ridgeline Park – Northern Precinct** *"Road widths should accommodate two directional flow and on-street parking along the entire frontage of the park."*	The road hierarchy plan in **Figure 5-7** of **Appendix A** shows the road to the northern side of the ridgeline park as part Collector Road – Minor/Major being 22.4m wide and part Collector Road - Minor with a width of 20.4m. Both are suitable for two way traffic, on-street parking and buses. The Figure titled 'Proposed Bus Network' in **Appendix A** demonstrates the extension of Bus Route 33 can follow a loop service with a route along the road bordering the ridgeline park. Further details will be resolved with a future application for subdivision of the Northern Precinct. Road width and hierarchy will be included in the site-specific DCP to be submitted with the application for the first future superlot subdivision. ***This matter is considered to have been addressed and resolved.***
WCC	**Northern Precinct** "*The road separating the foreshore and park/cafe is likely to attract anti-social activity. The road should terminate at intersection of foreshore road and park frontage road as shown below. (Note attached image was illegible)* *The southern road off the roundabout should terminate at the roundabout as shown below. (Note attached image was illegible) (Ridgeline Park-Northern Precinct).*"	This section of road is shown in the road hierarchy plan in **Figure 5-7** of **Appendix A** as a Collector Road linking up with Yallah Bay Road. This will allow traffic to continue south from the foreshore area without looping back past the ridgeline park. The final road layout will be subject to further refinement with the site-specific DCP to be submitted with the application for the first future superlot subdivision and with future details subdivision applications for the Northern Precinct. ***This matter is considered to have been addressed and resolved.***
WCC	**Northern Precinct** *"The cafe will likely require parking and this should be shown on point park"*	The café is shown as a conceptual feature linking the ridgeline park with the foreshore. The actual provision of a café would be subject to a separate future development application and the provision of ancillary parking will also be considered with a future development application. This level of detail is not relevant to the modification of the Concept Approval. ***This matter is considered to have been addressed and resolved.***
WCC	**Northern Precinct** *"Community gardens are generally not supported by Council in this instance as their ongoing management is problematic (Ridgeline Park-Northern Precinct)"*	The community garden is shown as a conceptual feature. The actual provision of a community garden would be subject to a separate future development application. This level of detail is not relevant to the modification of the Concept Approval. ***This matter is considered to have been addressed and resolved.***

WCC	**Southern Precinct** "*The loss of a sports field is not supported. A 120m x 67m field with appropriate runoffs and distance from the roads should be provided. Ideally the land containing the sports field, hardcourts and proposed community centre should be one contiguous parcel. This would assist to reduce costs to Council by minimising the duplication of infrastructure through shared parking, amenities and so on for both the community facility and sporting infrastructure. (Southern Precinct)*"	The modification does not propose changes to the Southern (Lakeside) Precinct. The modification does not propose to change the location and set out of the playing fields in the Central Precinct. ***This matter is considered to have been addressed and resolved.***
WCC	**Southern Precinct** *"Area 6 as shown on Drawing number L1003 should be reconsidered in context with the surrounding land use. (Southern Precinct)"*	The modification does not propose changes to the Southern (Lakeside) Precinct. The area labelled '6' is an area of open space and environmental lands to achieve a buffer to the land set aside for the Albion Park Rail Bypass (see extract below). It is a suitable location for publicly accessible open space enhancing the setting of residential land to the north and the neighbourhood centre to the east.  ***This matter is considered to have been addressed and resolved.***

APPENDIX

G

EMAIL FROM PETERSON BUSHFIRE CONSULTANTS

Adam Clarke

From: David Peterson <david@petersonbushfire.com.au>
Sent: Tuesday, 20 August 2019 3:34 PM
To: Adam Clarke
Subject: Re: RE: Tallawarra Lands: Bushfire Query

Follow Up Flag: Follow up
Flag Status: Completed

Hi Adam,

I left a message on your office phone this afternoon.

I spoke to the assessing RFS office Brad Bourke. His concern is the potential for there to be a grassland hazard within the Council property. I explained that it is semi-managed and is occasionally slashed (as evident from Nearmap). More importantly, I explained that the grass fuel is purely Kikuyu grass and not native grasses assumed by the hazard and APZ tables in Planning for Bushfire Protection and AS 3959.

He said that a perimeter road is not essential but would like to see the dedication of a suitable APZ in the rear of the adjoining lots. An APZ dimension of 10 m would be required to address the grassland hazard. This distance could change on the release if the new Planning for Bushfire Protection (the new grassland provisions have not yet been released so we are planning in the dark so to speak).

Alternatively, we need to obtain written support from Council that the Kikuyu will be managed along the interface.

Regards
Dave

peterson bushfire.
expert consulting services

david peterson
0455 024 480 • david@petersonbushfire.com.au
po box 391 terrigal nsw 2260 • petersonbushfire.com.au

FPA AUSTRALIA (NO.BPAD18882) BPAD LEVEL 3 ACCREDITED PRACTITIONER
ABN 28 607 444 833

---- On Tue, 20 Aug 2019 14:09:34 +1000 Adam Clarke <adam.clarke@cardno.com.au> wrote ----

> Hi Dave
>
> Have you any feedback from RFS on this?
>
> Cheers

APPENDIX

H

BIOSIS LETTER DATED 19 OCTOBER 2018

19 October 2018

Michael St Clair
Planner
Cardno
Ground Floor, 16 Burelli Street,
Wollongong, New South Wales 2500

Dear Michael

Modification to concept plan approval – Tallawarra Lands, Yallah, New South Wales

Our Ref: Matter 24090

This letter addresses the comments received by Wollongong City Council on 31 July 2018 in relation to the rezoning of the Tallawarra Lands precinct (MP 09_0131 MOD 1) (the study area). Under point 11, Wollongong City Council have raised the following query in relation to the project:

> *"The Heritage Impact Assessment Report prepared by Biosis appears to indicate a downgrading of the potential archaeological significance of a range of identified Archaeological sites detailed in the earlier reporting. Evidence gathered by Council about this estate appears to indicate a significant history of transactions and history that is not reflected in the reporting and which may call into questions some of the assumptions and conclusions in the report. Council considers that the Heritage Impact Assessment Report prepared by Biosis should be amended to reflect the substantial additional historical records available to ensure that the conclusions made about the potential archaeological sites are properly considered and that the assumptions made in the absence of this evidence are correct."*

As part of the preparation of the Heritage Impact Assessment (HIA) report for this project Biosis undertake a substantial amount of supplementary research led to a reconsideration of the archaeological potential of the study area. The supplementary historical research included a review of title documents, parish maps, crown plans, historical aerial photography and historical subdivision plans held by the Mitchell Library and Illawarra Historical Society.

Biosis has considered the information supplied by Wollongong City Council and determined the following:

- The estate known as 'Athanlin' or 'Yallah' was a large property in excess of 3000 acres, of which the study area comprises a small component. The history of this property is considered as part of Section 3.5 of the report (Biosis 2017). Biosis acknowledges the historical context does not contain a detailed chain of title for the Central Precinct. This is due to the history of ownership for the study area being convoluted with limited information relating to precise transactions and the spatial relationship of the various owners and tenants that comprised the estate.
- Biosis undertook a review of crown plans in the vicinity of the Central Precinct, this includes a "*Plan of a road at Yallah. From the West boundary of Patrick Osbourne's property to the Dapto Road through the lands of Andrew Thompson*" surveyed in 1861 does not show any evidence of cottages or homesteads within the Central Precinct, it however does indicate that there is a lane leading to

numerous small farms located within Patrick Osbourne's property. A larger version of this map is appended to this letter.

- The 1904 "*Part of the Famous Lakelands Estate fronting the Main South Coast Road and extending to Lake Illawarra*" subdivision plan (Figure 9 in Biosis 2017) indicates that there are no cottages within the study area, however there are cottages immediately to the north and east. In particular, the farm to the east corresponds with the "land leading to numerous small farms" identified on the 1860 plan.
- Based upon the additional research, there is no evidence to suggest TH2 and TH3 date to the 19th century occupation of the study area. These structures are not identified on the 1904 or 1919 subdivision plans of the Lakelands estate. The earliest evidence of these structures is on the 1949 aerial of the study area (Figure 10, Biosis 2017).
- During the field inspection the entire study area was traversed. Limited physical evidence was identified outside of the known building locations (TH2, TH3) within the Central Precinct. Due to the steep topography within the study area and structures would have needed substantial landscaping works to create a level building envelope. No evidence for land preparation activities was identified outside of TH2 and TH3.

Biosis concurs with Wollongong City Council that archaeological remains associated with the early to mid 19th century occupation of the early land grants associated with the study area would have substantial potential to answer research questions relating to the early occupation of the region. However, Biosis believes that there is limited evidence for any dwellings or farms associated with this activity within the study area. The research completed by Biosis indicates that the farms located to the north and east of the Central Precinct however may yield this information. Evidence of mid to late 20th century farming practices is unlikely to contribute to the understanding of the region and therefore Biosis has concluded that TH2 and TH3 have limited archaeological potential.

As the study area does not contain any areas of identified potential, the management of any archaeological remains is ideally suited to the implementation of an unexpected finds protocol, as per Recommendation 2 within the Biosis 2017 report.

Please contact me on 0407 808 527 if you have any enquiries.

Yours sincerely

Alexander Beben
Principal Archaeologist – NSW

References

Biosis 2017. *Tallawarra Lands Northern and Central Precincts Statement of Heritage Impact. Report for Cardno on behalf of Bridgehill*. Authors: R. Morris & A. Beben, Biosis Pty Ltd, Sydney. Project no. 24090

Laid before the Executive Council the 27th September 1861. Minute 61/43.

PLAN

of a road at

YALLAH

From the West boundary of Patrick Osbornes property

to the DAPTO Road

Through the lands of Andrew Thompson

ILLAWARRA

Scale 8 chains to an inch

Isy Bank
Marshall

Pt. Osborne

B Corner Post

boundary of Browne's Grant

Surrey see plan 61/15

From Marshall Mount see plan 61/11

MAIN ROAD FROM DAPTO TO JAMBEROO

REFERENCE

From A	West 1°28' North	1·79 chains
	West 7°10' South	8·08 "
	West 3°30' South	2·84 "
	West 7° South	4·42 "
	West 18°15' North	2·46 "
	West 17°30' North	27·50 "
	North 35°15' West	1·40 "
	North 13°30' West	7·80 "
	North 30 min West	2·59 "
	North 35°45' West	4·45 "
	West 17°15' North	2·82 "
	West 31°33' North	12·91 "
	North 31°12' West	3·33 "
	North 27°15' West	12·35 "
	North 23°10' West	4·08 "
	North 21°8' West	4·21 to B
	Total	108·03

EVAN EVANS

W

E

Post marked A

For Open and dedicating remarking of this road ride R832/1603

Proposed road

West 19° North 30·62 chains

ANDREW THOMPSON land

50 links wide

West 5°30' South 17 chains

New fence

Fence

Post marked A

A

PATRICK OSBORNE

Lane leading to various small farms

Boundary

Proposed to be opened as a Parish road under Act of Council 4. Wm IV. No II.

Proclaimed by Gazette Notice of 31st October 1861 fol 2298

Confirmed " " " 6th February 1862 " 304

Opened " " " 28 August 1862 1644 62/9192

Transmitted with my letter and book of Reference of the same date

No 61/14. 6th

212-1603