



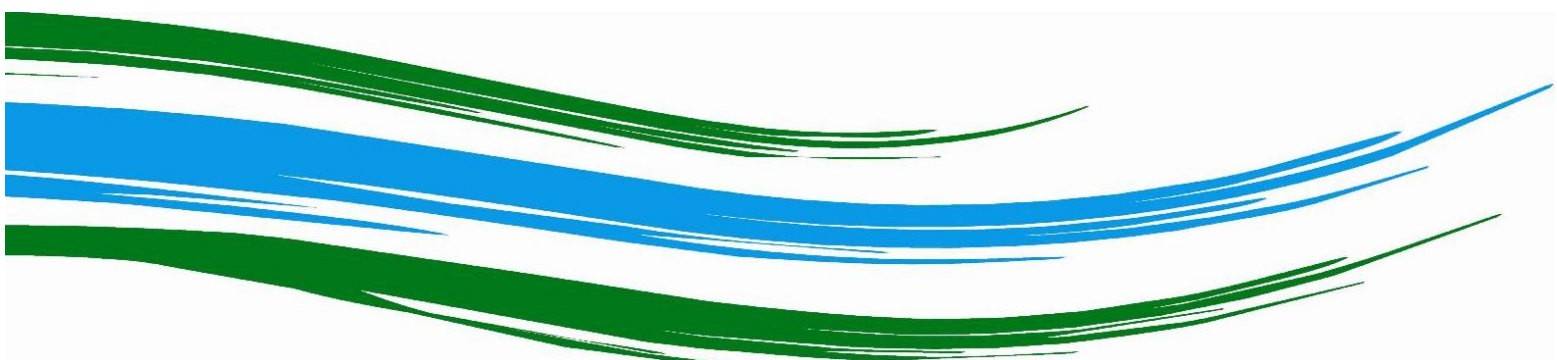
# Camden Council

## Attachments

**Ordinary Council Meeting**  
**25 September 2018**

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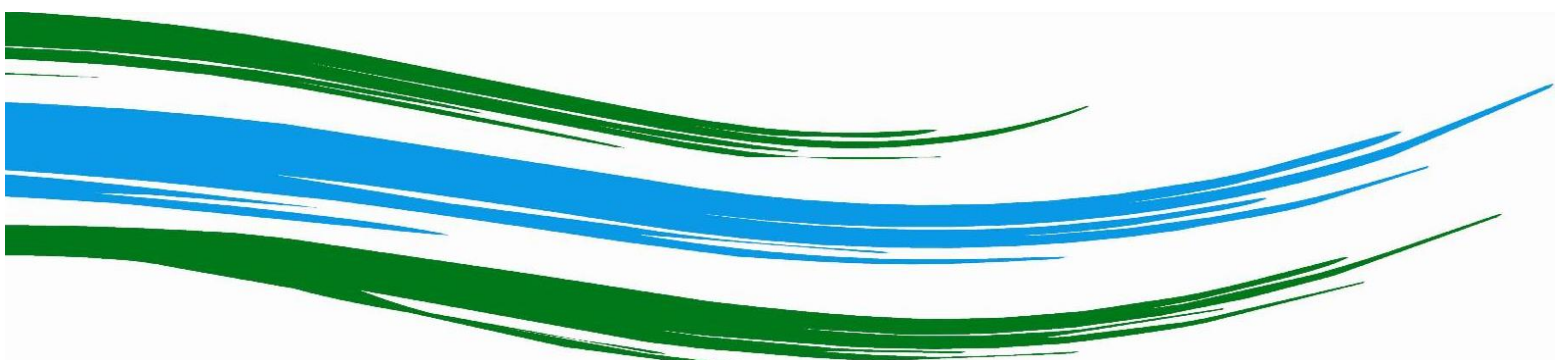
**Camden Council**  
**Administration Centre**  
**70 Central Avenue**  
**Oran Park**



# ORDINARY COUNCIL

## ATTACHMENTS - ORDINARY COUNCIL

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SJB Planning



# Lot 102, 182 Raby Road, Gledswood Hills

Planning Proposal

March 2018 | Revised Final

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## Executive Summary

This Planning Proposal (PP) has been prepared on behalf of the owners (V & E Piscuineri) of 182 Raby Road Gledswood Hills (Lot 102 DP 1193881) and seeks to rezone a portion of land (of approximately 2,797 m<sup>2</sup> in area which represents 3.9% of the total site area) at the southern end of the site from RU2 Rural Landscape to R5 Large Lot Residential.

The site is currently affected by a split zoning and sits within two (2) different Local Government Areas (LGA's). Much of the site is zoned RU2 Rural Landscape (66,851m<sup>2</sup>) under the Camden LEP 2010, with a portion of the site zoned R5 Large Lot Residential (2,322m<sup>2</sup>) under the Camden LEP 2010 and E3 Environmental Management under the Campbelltown LEP 2015.

The proposal will increase the area of the site that is currently zoned R5 (from 2,322 m<sup>2</sup> to 5,119m<sup>2</sup>). At present, the existing R5 zoned land is 2,322m<sup>2</sup> in size and as such is less than the 4,000m<sup>2</sup> minimum lot size applicable under the Camden LEP 2010. In this regard, development of this land is severely constrained. The PP seek to resolve the existing anomaly with the current zoning under the Camden LEP 2010.

It will also allow for subdivision of the existing site into two (2) new lots, resulting in the creation of one (1) additional lot for R5 Large Lot Residential housing. This will utilise the existing 2,322 m<sup>2</sup> portion of the site that adjoins 184C Raby Road to the south-west and follows the existing subdivision pattern of rural residential housing.

In this regard, the PP is of a very minor nature and essentially seeks to rationalise the existing zoning controls (i.e. seeks only to adjust the zone boundary and apply the minimum lot size controls). It also responds to existing physical constraints that impact upon the existing lot (i.e. the public road and access way).

The site is irregular in shape and has an area of approximately 7.215 hectares. It is largely cleared and comprises open grasslands with scattered eucalypts, mown lawns and landscaped gardens. Existing development comprises a single storey detached dwelling, swimming pool and rural sheds.

The site forms part of an Urban Release Area nominated in the Camden LEP 2010. It is located approximately 1km north-east of urban development in the Turner Road Precinct, within the South West Priority Growth Area, under the Growth Centres SEPP 2006.

The development of surrounding new release areas (e.g. Turner Road, Gregory Hills, Catherine Fields and Oran Park) is delivering significant benefits and opportunities, including the creation of new residential communities, with key infrastructure and improved connections to employment and services.

The site is located on Raby Road, approximately 3.5km north-west of the Raby Road and Hume Highway intersection, which connects to the M5 and M7 providing access to Greater Sydney. The site is also located on an existing bus route and is located near planned future bus routes through 'The Crest' along Gledswood Hills Drive. These routes will provide access to Minto, Campbelltown and the Leppington Railway Station within the proposed Major Centre at Leppington.

'The Crest' directly adjoins the site being developed for residential housing by Mirvac Homes Pty Ltd. This development has brought the provision of all services which cover electricity, gas and NBN to the site.

The site is located in proximity to nearby retail, commercial, employment, education, community services and transport connections, presents an opportunity to augment the supply of affordable housing in south-west

Sydney. It also presents an opportunity to increase the usage of these new services and facilities and assist with the funding of new infrastructure.

The environmental and scenic qualities of the site and surrounding ridgelines will be maintained if a small portion of the site is redeveloped with large lot residential development. Given that the locality of the site is undergoing transformation to facilitate urban development, the current RU2 Rural Landscape zoning of this portion of the site is an anomaly and clearly not the highest and best use of the land (and was not intended in the original rezoning).

The submission recommends that a portion of the site be rezoned from RU2 Rural Landscape to R5 Large Lot Residential to allow one (1) large lot semi-rural residential allotment at the site, which is compatible with adjoining development and sympathetic to the environmental qualities of the site.

The submission provides an analysis of the constraints and the opportunities of the site. Support for this PP is based on the following:

- **Infill rural residential development opportunity:**  
The redevelopment of the site represents an opportunity to provide additional rural residential housing in a location that will allow access to nearby retail and commercial facilities, education and community facilities, public transport and other urban infrastructure of the adjoining urban release areas and that can integrate with adjoining urban release areas.
- **Consistency with the adjoining development:**  
Rezoning of the site is consistent with emerging residential development to the west and north-west, and will not result in any adverse impacts and therefore will maintain the existing scenic quality. The PP represents an opportunity to deliver a compatible rural residential infill providing additional housing opportunities which will be located within the proximity of employment, services, education, recreation and transport facilities.
- **Consistency with the planning framework:**  
The PP is consistent with relevant state and local government strategic plans namely, A Plan for Growing Sydney, the draft Western City District Plan, the Camden Community Strategic Plan 2017, the Camden Residential Strategy 2008 and the Camden Rural Lands Strategy 2017.
- **Development opportunities and constraints:**  
The PP is supported by a Visual Impact Assessment, Ecological Assessment and Supplementary Contamination Investigation, which conclude that the site is suitable for the proposed rezoning amendment and any associated development likely to occur as a result (i.e. one (1) lot in the R5 zone with future residential dwelling house).
- **Visual Impact:**  
The PP will enable one (1) additional large lot residential lot to be achieved with a minimum lot size of 4,000m<sup>2</sup>. This lot is not visible from the east due to existing vegetation along the ridgeline. When viewed from Raby Road to the north, it will be viewed against a foreground and background of urban and large lot residential development.
- **Transport and Connectivity:**  
The site has frontage to Raby Road and easy access to Camden Valley Way and the nearby M5/M7 and Hume Highway. The site is close to existing and future bus services and therefore will have good access to proposed neighbouring town centres and the Leppington Railway Station within the future Major Centre at Leppington.  
  
The proposed lot has direct access to a Public Road (Mayfield Place) which connects to Gledswood Hills Drive. It is also located near a planned future bus route, along Gledswood Hills Drive. The proposal is consistent with Council's recently released Rural Lands Strategy 2017.



#### Recommendations

Based on the issues addressed in this PP, it is recommended that Camden Council resolve to support the intention of the PP and prepare an amendment (Draft LEP) to the Camden LEP 2010 in the following way:

- Amend the Land Zoning Map to extend the application of the R5 Large Lot Residential and reduce the size of the RU2 Rural Landscape Zone in accordance with dimensions shown on the attached Plan Showing Proposed Zoning (refer to Attachment 3);
- Amend the Lot Size Map to apply a minimum lot size of 4,000m<sup>2</sup> for the R5 Large Lot Residential zone to correlate with the afore-mentioned rezoning; and
- Maintain a maximum building height of 9.5m on the Height of Buildings Map.

## 1.0 Introduction

### 1.1 Overview

This Planning Proposal (PP) has been prepared for V & E Pisciuneri, the owners of 182 Raby Road, Gledswood Hills ('the subject site'). The proposal seeks to amend the existing planning controls applicable under the Camden Local Environmental Plan 2010 (CLEP 2010) to allow for R5 large lot residential subdivision of the subject site.

The proposal has no adverse impacts and is consistent with adjoining development in the locality. It has strategic merit given the amount of growth that is planned to occur within the Camden LGA and more broadly, within the South West Priority Growth Area.

The PP has been prepared in accordance with guidelines developed by the Department of Planning and Environment (DPE), namely "*A Guide to Preparing Planning Proposals*" and "*A Guide to Preparing Local Environmental Plans*".

### 1.2 Scope and Format

The following chapters detail the merits of the proposed rezoning and are set out as follows:

- Section 2.0 provides a description of the site and its context, including identification of the land to which the proposed rezoning applies and existing development;
- Section 3.0 outlines the PP along with the matters to be considered in the abovementioned "*A Guide to Preparing Planning Proposals*"; and
- Section 4.0 provides the conclusions and recommendations to proceed with the PP to Gateway Determination to amend the Camden LEP 2010.

### 1.3 Supporting Plans and Documentation

The proposal is supported by the following attachments.

Document name	Prepared by
Copy of Deposited Plan 1193881	Brown Consulting
Survey Plan	YSCO Geomatics
Existing and Proposed Zoning Plans	YSCO Geomatics
Ecological Assessment	Eco Logical Australia
Visual Impact Assessment	MUSEcape
Land Capability Assessment	Douglas Partners
Phase 2 Contamination Assessment	Douglas Partners
Supplementary Contamination Investigation	Douglas Partners
Consistency with State and Environmental Policies Table	SJB Planning
Compliance with Section 117 Directions Table	SJB Planning

Table 1: Plans and Documents Prepared to Accompany this Planning Proposal

## 2.0 Site Description and Context

### 2.1 Overview

This section describes the location of the site, existing development on the land, the current planning framework including both state and local government strategic plans applying to the land.

### 2.2 Site Context and Locality

The area that is the subject of this Planning Proposal is shown in Figure 1. The property is situated on the boundary of the Camden and Campbelltown Local Government Area's (LGA's). The area is predominantly rural land that is undergoing significant urban growth and change.

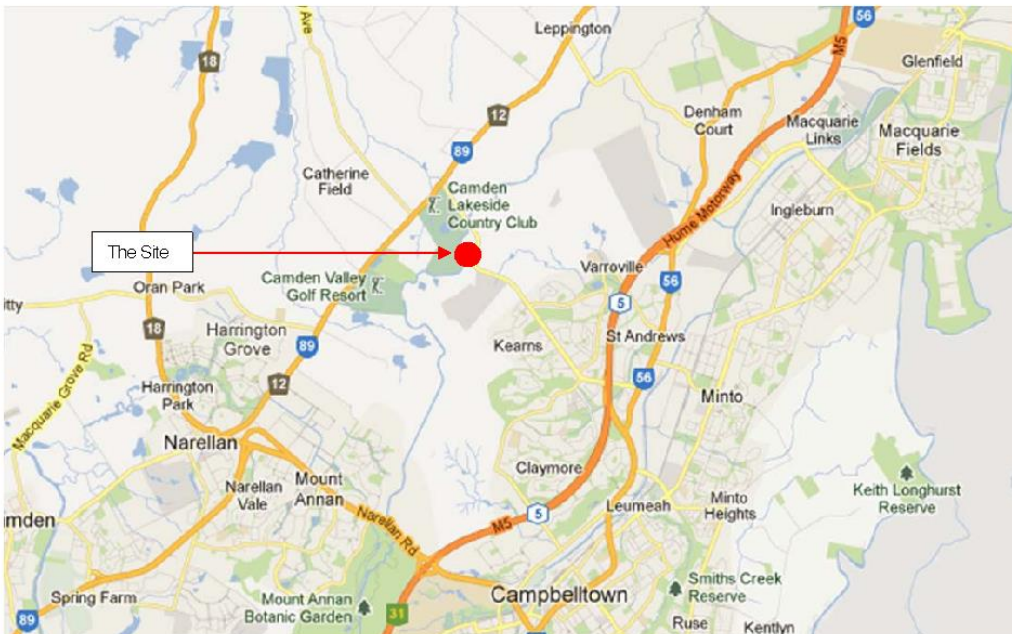


Figure 1: Location of Site (Source: Google Maps)

The site is located on the southern side of Raby Road, approximately 3.5km north-west of the Hume Highway intersection. The Hume Highway connects to the M5 and M7 approximately 10km to the north, providing access to Greater Sydney. As such, the site has proximity to major roads that provide key connections, both north-south and east-west.

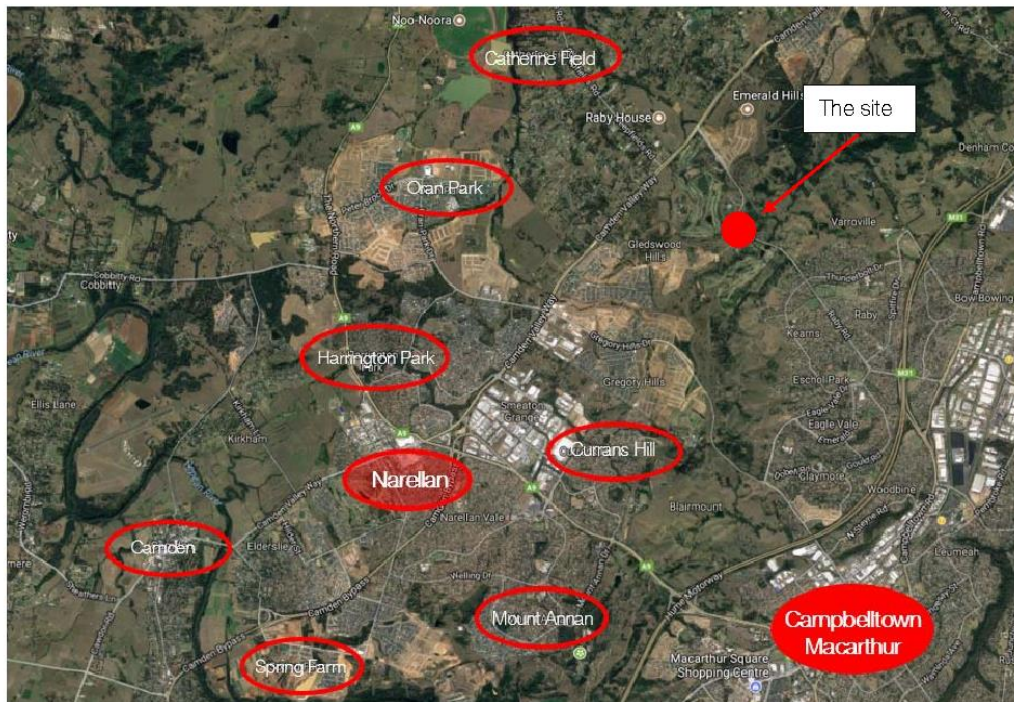


Figure 2: Strategic Context

The site is also located on an existing bus route and is located near planned future bus routes through 'The Crest' along Gledswood Hills Drive. These routes will provide access to Minto, Campbelltown and the Leppington Railway Station within the proposed Major Centre at Leppington.

**2.3 Site Description**

The subject site is legally described as Lot 102 DP 1193881, known as 182 Raby Road, Gledswood Hills. It is an irregular shaped allotment, located on the southern side of Raby Road and comprises a site area of approximately 7.215 ha.

Existing development currently situated on the RU2 zoned land includes a single storey brick dwelling, swimming pool and metal sheds as indicated on the survey plan provided (refer to Attachment 2).

**2.4 Surrounding Land Uses and Built Form**

The site is located just outside the South West Priority Growth Area. As such, the area has been identified as a focus for growth, with a substantial increase in population projected in the next 20 years. It is one of the fastest growing districts in Greater Sydney. The surrounding context is illustrated in Figure 3.

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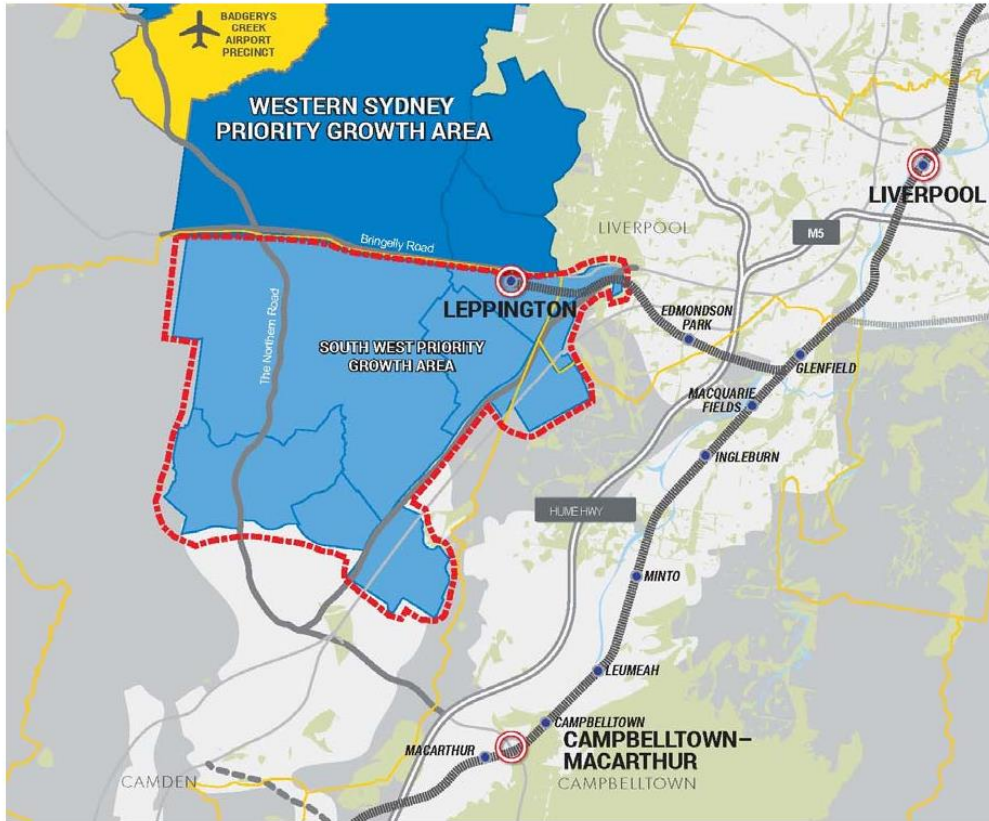


Figure 3: South West Priority Growth Area (Source: Department of Planning and Environment)

The site is identified as an urban release area in the Camden LEP 2010, as shown in Figure 4. New communities are emerging in surrounding precincts such as Turner Road, El Caballo Blanco/Gledswood, Camden Lakeside and Emerald Hills located on the southern side of Camden Valley Way.

Oran Park, Catherine Field and Leppington are located on the northern side of Camden Valley Way. There are some neighbourhood shops, health, education facilities and community uses within the surrounding suburbs.

For example, the Turner Road Precinct will include a new neighbourhood centre, mixed use entertainment precinct, and a school, along with land for business and industrial uses. The Emerald Hills Estate will also contain a new neighbourhood centre.

Narellan and Leppington are the two closest district centres, located approximately 5.8km south-west and 3.6km north-east of the site respectively. These centres offer shops, services, health, education, employment and transport facilities.

Campbelltown-Macarthur is the nearest high order strategic centre, which again provides a much more substantial range of services and facilities including major retail, employment, health (including various hospitals) and tertiary education.

These suburbs will be connected to the proposed new Western Sydney airport at Badgerys Creek and the broader Western Sydney employment Area.

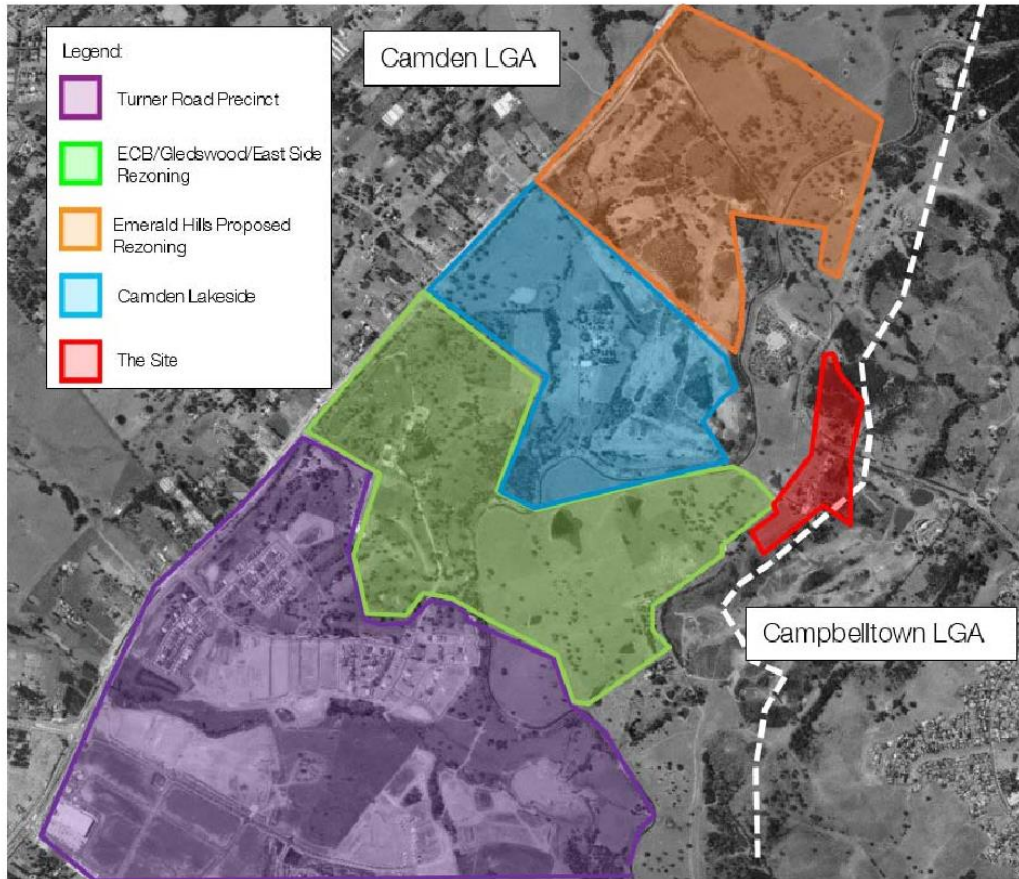


Figure 4: Site Context (Source: Six Maps)

## 3.0 Background

### 3.1 Rezoning of ECBG and East Side Lands

The subject site was rezoned as part of the ECB Gledswood rezoning which commenced in 2004 and was gazetted in 2013. The El Caballo Blanco/Gledswood rezoning included the East Side lands under several different land ownerships, including the subject site owned by the Pisciuneri family.

The rezoning applied to the broader area and was informed by a Local Environmental Study (LES) and several different reports, which included comprehensive environmental studies. The objectives of the LES were to assess the suitability of the site for the development of lifestyle housing to integrate with the natural and cultural characteristics of the study area to identify areas appropriate for development as well as those that should be preserved/enhanced/rehabilitated.

We believe, the intention of the original rezoning was to run the R5 zone along the southern edge of the existing ROC, which did not occur in error. There are existing physical constraints that impact upon the existing lot (i.e. the public road and access way).

### 4.0 Statutory Framework

#### 4.1 Zoning

The site is located on the boundary of two different LGA's and as such, the zoning is covered by two different Environmental Planning Instruments (EPI's).

##### 4.1.1 Camden Local Environmental Plan 2010

The site is currently zoned part RU2 Rural Landscape and part R5 Large Lot Residential under the Camden Local Environmental Plan 2010 (CLEP 2010), as shown in Figure 5 below.

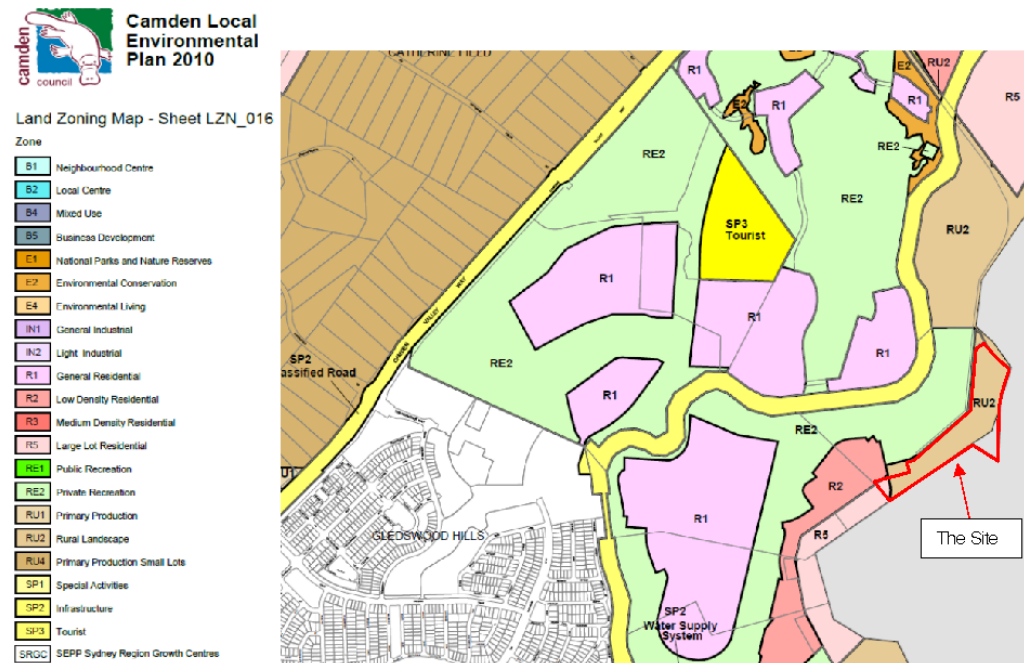


Figure 5: Zoning Extract from Camden LEP 2010

The zoning map at Figure 5 demonstrates that the site is located in close proximity to existing R1 General Residential zones in the Camden Lakeside precinct to the north-west of the site. North-east of the site is the Emerald Hills estate which is predominantly zoned for a mix of R2 Low Density Residential, with a B2 Local Centre.

##### 4.1.2 Campbelltown Local Environmental Plan 2015

Part of the site including the adjoining land to the east is zoned E3 Environmental Management, under the Campbelltown Local Environmental Plan 2015 as indicated in Figure 6.

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Figure 6: Zoning Extract from Campbelltown LEP 2015

Prior to the gazettal of the Turner Road Precinct under the Growth Centres SEPP, this area was zoned 7(d) Environmental Protection (Scenic Hills) which stretched westward to Camden Valley Way. A considerable proportion of the 7(d) Environmental Protection zone within the Camden LGA has since been eroded by the SEPP and subsequent and proposed re-zonings.

4.2 Urban Release Areas

The site forms part of the El Caballo Blanco/Gledswood Hills urban release area, as shown on the maps that form part of the CLEP 2010 (refer to Figure 7 below).

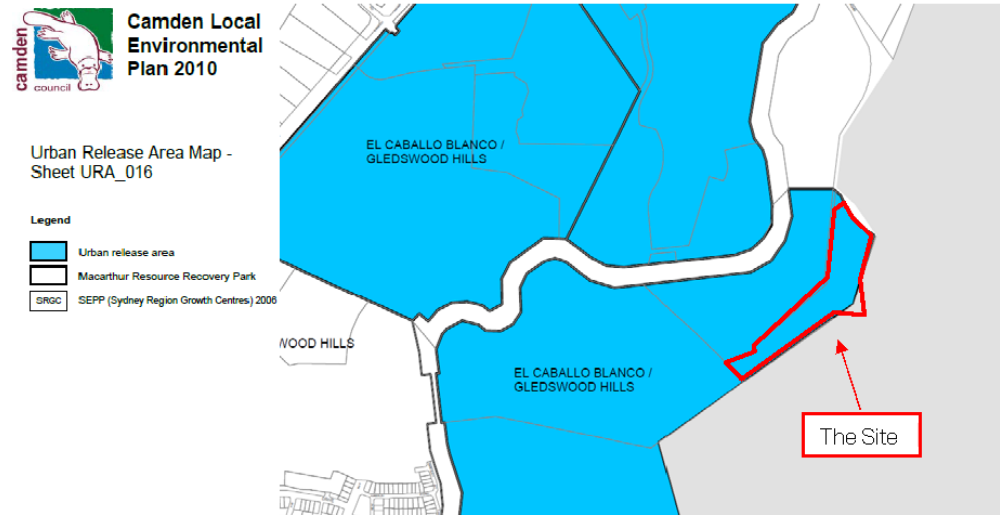


Figure 7: Urban Release Area Map Extract from Camden LEP 2010

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### 4.3 Height of Buildings

A building height restriction of 9.5 metres currently apply to the site (as shown in Figure 8).



Figure 8: Height of Buildings Map Extract from Camden LEP 2010.

### 4.4 Minimum Subdivision Lot Size

There are two different minimum lot size requirements that apply to the site under the Camden LEP, which reflect the zone boundaries. A minimum lot size of 4,000m<sup>2</sup> applies to the R5 Large Lot Residential portion of the site and a minimum of 2 hectares applies to the RU2 Rural Landscape zone (refer to Figure 9).

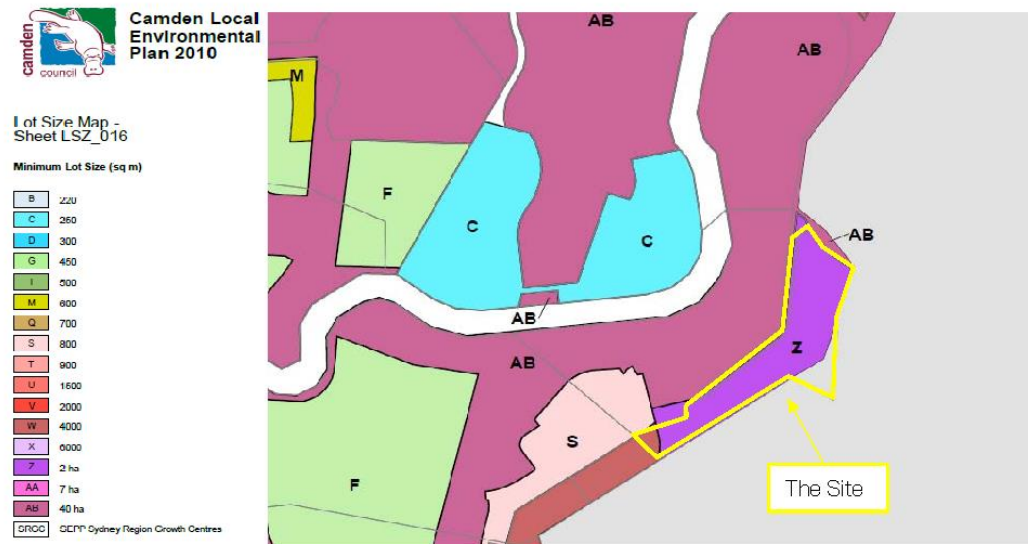


Figure 9: Lot Size Map Extract from Camden LEP 2010

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The minimum lot size requirement severely constrains any development involving residential subdivision, which would fall short of the above requirement and therefore contravene the existing development standard. At present, the existing R5 zoned land is 2,322m<sup>2</sup> in size and as such is less than the 4,000m<sup>2</sup> minimum lot size applicable under the Camden LEP 2010. In this regard, development of this land is severely and physically constrained.

Resolving the current anomaly with the existing zoning will allow for subdivision of the existing site into two (2) new lots, resulting in the creation of one (1) additional lot for R5 Large Lot Residential housing.

4.5 Heritage Conservation

There are no heritage items and/or heritage conservation areas in close proximity to the site that would be affected by the proposal (refer to Figure 10).

The proposal is located some distance away from the Upper Canal and the Gledswood Homestead, which are heritage items listed on both the State Heritage Register and in Schedule 5 of the CLEP 2010.

Development of the land affected by this PP will not be discernible from the canal or the Homestead in the context of emerging development.

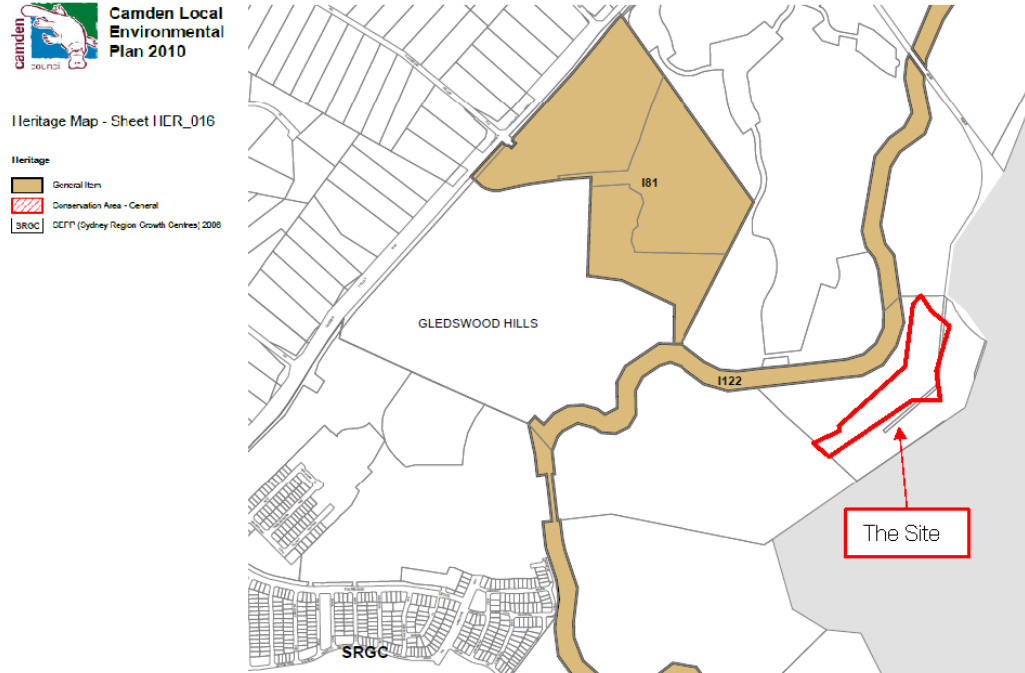


Figure 10: Heritage Map Extract from Camden LEP 2010

## 5.0 The Planning Proposal

### 5.1 Overview

This section addresses the DPE publication *Planning Proposals – A Guide to Preparing Planning Proposals*. In this regard, the PP includes the following components:

- Objectives and intended outcomes;
- Explanation of provisions;
- Justification;
- Mapping;
- Community consultation; and
- Project timeline.

### 5.2 Objectives and Intended Outcomes

The objective of this Planning Proposal are as follows:

- To facilitate renewal to achieve the highest and best use of the site, given that the land is located within an urban release area and in proximity to the South West Priority Growth Area, identified as a focus for population growth and increased housing supply;
- To ensure that re-development is compatible with the range of surrounding land uses (i.e. rural, residential, and recreational uses adjoining land set aside for environmental management in the neighbouring LGA);
- To provide for residential housing in a rural setting whilst minimising impacts on the environment and scenic quality; and
- To allow for residential subdivision to create one (1) additional large rural residential lot and rationalise the existing anomaly associated with the current zoning and lot size control, which effectively divides the site.

### 5.3 Explanations of Provisions

This Planning Proposal seeks to amend the Camden LEP 2010 in the following manner:

- Amend the Land Zoning Map, sheet LZN\_016, to extend the application of the R5 Large Lot Residential zone and reduce the size of the RU2 Rural Landscape zone on the subject site; and
- Amend the Lot Size Map, sheet LSZ\_016, to apply a minimum lot size of 4,000m<sup>2</sup> to land within the R5 Large Lot Residential zone to correlate with the aforementioned rezoning;

There are no other provisions that require amendment. The 9.5m maximum building height control would be retained, as shown on the Height of Buildings Map. As such, development would be restricted to a maximum of two (2) storeys.

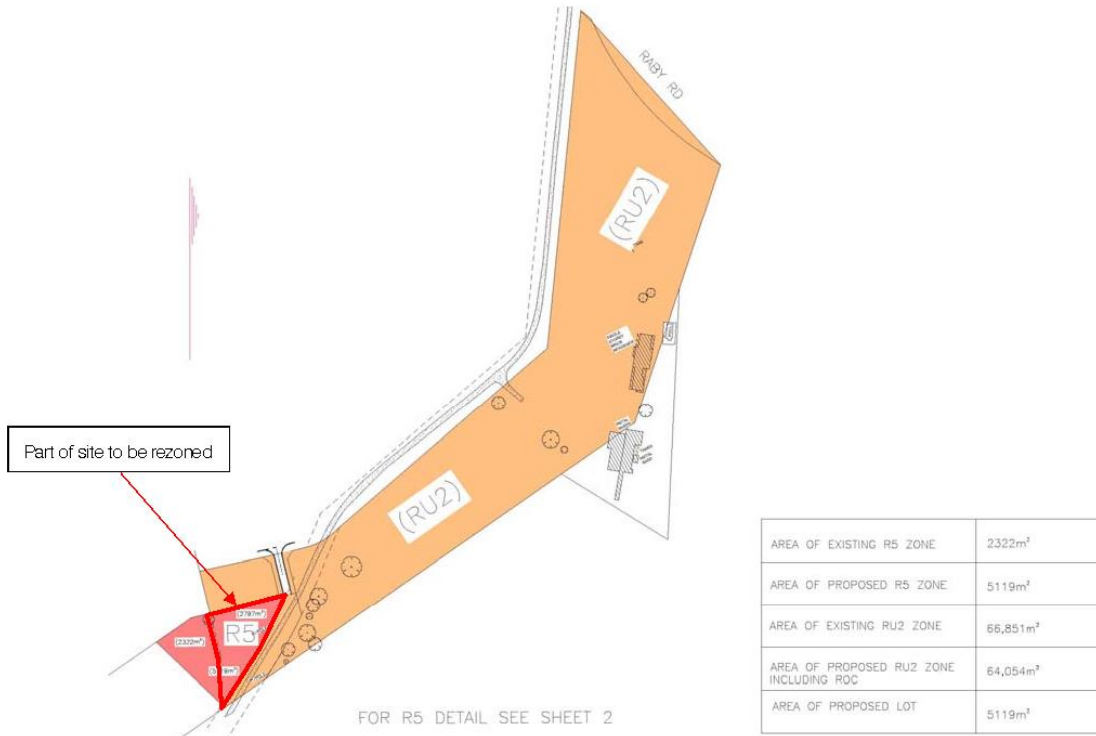


Figure 11: Extract from proposed amended CLEP 2010 Zoning Map



Figure 12: Extract from proposed amended CLEP 2010 Zoning Map

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The proposed amendments do not require the inclusion of site specific DCP controls, given there are existing provisions for large lot residential development in Part D the Camden DCP 2010 and site specific provisions for ECB Gledswood in Part C.

#### 5.4 Justification

This section addresses the need for the rezoning amendment, identifies the background studies undertaken, why the Planning Proposal is the best approach, and what the community benefits will be.

##### 5.4.1 Section A – Need for the Planning Proposal

###### Q1 Is the planning proposal a result of any strategic study or report?

The subject site was rezoned as part of the ECB Gledswood rezoning which was finalised in 2013. The rezoning applied to the broader area and was informed by a Local Environmental Study (LES) and several different reports.

This PP is supported by the following reports:

- Visual Impact Assessment (VIA) prepared by Musecape;
- Supplementary Contamination Investigation (SCI) prepared by Douglas Partners; and
- Ecological Assessment prepared by Ecological Australia (ELA).

The VIA concludes that the proposed rezoning and any likely subsequent development can be accommodated without any unacceptable change to the perception of the site, provided the recommended mitigative measures are implemented (i.e. screen planting and exterior colours/finishes to minimise visual impact of the development). The proposal is within the limits of acceptable change and any visual impacts will be minor and manageable.

The result of the SCI and the previous investigations already undertaken, confirms that the site and surrounds have a history of rural residential land use, with recent use of the site as a compound for the adjoining subdivision (see SCI report for further details in this regard). No further investigations or remediation works are warranted and the site is considered suitable for the proposed residential subdivision.

The ELA report concludes the ecological values of the subject site are poor, as the site is either cleared or dominated by exotic grasses. Three (3) Cumberland Plain Woodland canopy species are present but will be retained as part of the proposed re-zoning. As such, the proposal will not impact the ecological values of the site.

###### Q2. Is the Planning Proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The PP is the most appropriate method to achieve the intended outcome of the development, being to facilitate redevelopment to achieve the highest and best use of the site, taking into account the site constraints and surrounding land uses.

This will allow for R5 Large Lot Residential development, facilitate subdivision of the existing lot into two (2) new lots and rationalise the anomaly associated with the current zoning, which effectively already divides the site.

It will provide for the orderly economic use and development of the land, taking into account the opportunities and constraints of the site. It provides an appropriate transition between development situated on both the adjoining and surrounding land.

In this regard, it ensures a graduation between existing rural and rural residential development, emerging low density residential development, private recreation land (golf estate) and the environmental protection land within the neighbouring LGA.

The proposal maintains the existing scenic quality, increases housing supply and optimises the use of infrastructure. The section of the site that is proposed for rezoning is currently zoned RU2 Rural Landscape, which has limited development potential and is physically divided by the existing bitumen access way.

Given the surrounding context of development and the fact that the land is located within an identified Urban Release Area, as shown on Council's Urban Release Area Map in the CLEP 2010, it is reasonable to review and amend the existing planning controls to ensure the highest and best use.

Zoning for large lot residential development is considered to be the best method of facilitating redevelopment and/or achieving renewal, that is compatible with surrounding development given the site constraints.

A site specific LEP amendment will ensure a detailed response to the site and deliver appropriate controls and mechanisms to ensure development will maintain the landscape and visual qualities of the site and enable a transition that is appropriate along the boundary of the adjoining LGA.

#### **5.4.2 Section B – Relationship to Strategic Planning Framework**

Q3. Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional strategy, or district plan or strategy (including any exhibited draft plans or strategies)?

There have been a number of strategic plans and/or reports that seek to increase housing capacity across the South West District, being it is Sydney's fastest growing District. The PP is consistent with the following strategic planning documents, applicable to the site as outlined below.

##### A Plan for Growing Sydney (2014)

A Plan for Growing Sydney released in 2014, is the NSW Government's plan for the future of the Sydney Metropolitan Area over the next 20 years. The Plan provides key directions and actions to guide Sydney's productivity, environmental management, and liveability, which includes the delivery of housing, employment, infrastructure and open space.

Relevant directions within the plan are listed below:

*"Direction 2.1: Accelerate housing supply across Sydney;"*

The proposal supports this objective and will deliver an additional lot which will increase housing supply and local housing choice.

*"Direction 2.3: Improve housing choice to suit different needs and lifestyles;"*

The proposal will result in the creation of new large lot residential development which will increase housing choice and support the delivery of a broader range of housing types (given that emerging development in the vicinity is predominantly in the form of single detached dwellings on small to medium sized lots).

*"Direction 4.3: Manage the impacts of development on the environment."*

The proposal will ensure that any resultant impacts associated with future development are likely to be negligible given that relevant technical studies have been submitted to demonstrate the land is suitable for the proposed rezoning, taking into account the opportunities and constraints of the site.

Draft Western Sydney District Plan (2017)

The draft Western City District Plan released by the Greater Sydney Commission in October 2017 replaces the draft South West District and West District plans, released in November 2016. One of the liveability actions is for Councils to increase housing capacity across the District.

The following planning priority is directly relevant to the proposal:

*“Planning Priority W5: Providing housing supply, choice and affordability, with access to jobs and services.”*

The proposal supports this objective and will provide additional housing supply and choice, close to jobs and services.

In order to increase housing supply and choice, Camden Council is required to implement the following actions and incorporate these into the local housing strategy:

- Monitor the delivery of Camden’s five-year housing target of 11,800 dwellings, recognising significant growth in the South West Priority Growth Area at Oran Park, Gregory Hills and Catherine Fields and other active greenfield areas;
- Continue to progress work on the South West Priority Growth Area with adjoining councils and the Department of Planning and Environment; and
- Should the need for additional housing capacity be identified, investigate opportunities for additional housing at local centres close to transport in the short to medium term that may assist in addressing housing diversity.

Camden Rural Lands Strategy 2017

The recently released Camden Rural Lands Strategy 2017 contains the following key planning principles:

- (1) *Protect Camden’s remaining rural lands;*
- (2) *Retain Camden’s valued scenic and cultural landscapes;*
- (3) *Provide certainty and avoid rural land fragmentation;*
- (4) *Minimise and manage rural land use conflict;*
- (5) *Enhance Camden’s Rural Economy;*
- (6) *Minimise unplanned non-agricultural development; and*
- (7) *Maximise opportunities for relocation of rural enterprises.*

This strategy is intended to guide decision making and does apply to land within the Southwest Priority Growth Area (SW PGA). It acknowledges that the eventual development of land within the SWPGA will reduce the total area of rural land to one third of the Camden LGA.

The strategy establishes criteria for the assessment of planning proposals for rezoning on rural land. The criteria for rezoning is addressed below in Table 2.

Assessment Criteria	Key Consideration (Pre-Gateway)
Proposals must be consistent with state and local strategic plans	<ul style="list-style-type: none"> <li>• Improvement /ongoing maintenance of biodiversity, ecological, scenic and productive values.</li> <li>• Agricultural land production values.</li> </ul>



Assessment Criteria	Key Consideration (Pre-Gateway)
<i>Response: Yes, the proposal is consistent with all relevant state and local strategic planning requirements.</i>	<ul style="list-style-type: none"> <li>Rural economic benefit.</li> <li>Net community benefit.</li> </ul>
Proposals must not adversely impact on the operation of existing rural enterprises.	<ul style="list-style-type: none"> <li>Existing intensive agricultural land uses.</li> <li>Land use conflict – utilisation of the Land Use Conflict Risk Assessment (LUCRA) tool developed by the NSW Department of Primary Industries.</li> </ul>
<i>Response: There are no existing agricultural rural land uses/enterprise being undertaken on the subject site.</i>	
Proposals must be a logical extension to existing urban areas.	<ul style="list-style-type: none"> <li>Proximity to public transport and other community services.</li> <li>Essential services availability (including cost of extending services or upgrading roads and other infrastructure).</li> </ul>
<i>Response: The site has been identified as being within an urban release area with the CLEP 2010 and in this regard is well located in terms of infrastructure and services.</i>	
Proposals must not reduce the quality of scenic landscapes, vistas, ridgelines or heritage values	<ul style="list-style-type: none"> <li>Siting and design impacts.</li> <li>Natural and physical constraints and opportunity of rural land, including high value vegetation, bushfire and flooding.</li> </ul>
<i>Response: The proposal will not significantly impact the quality of scenic landscapes, vistas, ridgelines or heritage values and a Visual Impact Assessment has been prepared to support the proposal and address this issue.</i>	

Table 2: Extract from Camden Council Rural Lands Strategy, Criteria for Rezoning Proposals

The PP will result in the creation of one (1) additional lot and will resolve an anomaly with the existing zoning, as the existing R5 zoned land is less than the 4,000m<sup>2</sup> minimum lot size.

As such, the proposal is consistent with Council's recently released Rural Land Strategy.

#### Other Council Policies

A range of local government studies have investigated opportunities to increase capacity for housing supply, including the Camden Community Strategic Plan (2017), Camden Residential Strategy (2008) and the Campbelltown Residential Development Strategy (2014).

The afore-mentioned strategies identify opportunities to implement the actions reflected in high order state government strategic planning documents and providing necessary infrastructure, whilst balancing the valued characteristics of the Camden LGA.

The proposal is consistent with Council's Residential Strategy 2008, which seeks to increase housing choice and supply. The strategy aims to guide the form and character of residential housing in Camden into the future.

Since the release of the strategy in 2008, there have already been significant changes, namely an increase in population growth, growth in commercial and retail centres and changes in household make-up. As such, it will be necessary to continue to increase housing supply to meet this demand and respond to the needs of the community.

## 5.5 Section B – Relationship to the Strategic Planning Framework

Q3(b). Does the proposal have strategic merit? Is it:

- Consistent with the relevant regional plan outside of the Greater Sydney Region, the relevant district plan within the Greater Sydney Region, or corridor/precinct plans applying to the site, including any draft regional, district or corridor/precinct plans released for public comment; or
- Consistent with a relevant local council strategy that has been endorsed by the Department; or
- Responding to a change in circumstances, such as the investment in new infrastructure or changing demographic trends that have not been recognised by existing planning controls?

Council's Residential Strategy was prepared to inform the then Draft Camden Local Environmental Plan 2010, and respond to the then applicable Draft South West Subregional Strategy 2007. Since that time, A Plan for Growing Sydney (2014) and the Draft Western City District Plan (2017) have been released.

The local planning study sought to deliver the housing targets in place at the time in the context of local social, economic and environmental objectives. It was intended to help Council to create dynamic and diverse local communities and provide a basis for economic development and infrastructure provision.

The Planning Proposal seeks to increase the area to which the R5 Large Lot Residential zone and facilitate the subdivision and redevelopment of the site. As such, the proposal has strategic merit as it satisfies the intent of key directions and/or priorities identified in the strategic planning framework.

This has informed the existing controls that apply to the site however it is apparent that there have been some significant shifts given the quantum of growth that is occurring and as such, it is necessary to revisit these controls not only in this instance but also to respond to emerging data contained with the Draft District Plan.

Q3(b). Does the proposal have site specific merit, having regard to the following:

- The natural environment (including known significant environmental values, resources or hazards);
- The existing uses, approved uses, and likely future uses of land in the vicinity of the proposal; and
- The services and infrastructure that are or will be available to meet the demands arising from the proposal and any proposed financial arrangements for infrastructure provision?

The proposal has strategic merit, in light of the afore-mentioned considerations which have largely been addressed under Question 3(a) above.

The land is located within an identified Urban Release Area under the Camden LEP 2010. It will not have a significant adverse impact on any environmental values or natural resources (as demonstrated in the technical reports submitted to accompany the proposal). The site is not subject to natural hazards of land slip or geotechnical instability, flooding, or bushfire hazard.

The proposal is justifiable in the context of surrounding growth, which will provide a graduation from development in the South West Priority Growth Area, which will accommodate around a third of Sydney's population growth over the next 30 years.

The proposal seeks to increase the extent of the R5 zone on the subject site to enable the creation of new rural residential allotment. Adjoining land to the south-east within the Camden LGA is zoned R5 Large Lot Residential, R2 Low Density Residential (i.e. the Mirvac Subdivision) and RU2 Rural Landscape.

The site is existing, serviced, urban land, which has available the full range of utility services, and public transport through frequent bus services.  
The site is physically divided by an existing bitumen access way and right of carriageway benefitting adjoining rural residential lots.

*Q4. Is the planning proposal consistent with a local council's Local Strategy, or other local strategic plan?*

The proposal has strategic merit in light of the afore-mentioned considerations which have largely been addressed under Question 3(a) above.

Council's Community Strategic Plan (2017) and the Camden Residential Strategy (2008) identify opportunities to implement the actions reflected in high order state government strategic planning documents and providing necessary infrastructure, whilst balancing the valued characteristics of the Camden LGA.

Namely, balancing the rural lifestyle, environment and character of historic towns, country villages and new suburban areas. The R5 Large Lot Residential zoning will allow for the protection of much of the site as rural land and retain significant vegetation. In this respect the rezoning would help to satisfy the demand for housing in the region and maintain key elements of the current rural character.

*Q.5 Is the planning proposal consistent with applicable state environmental planning policies?*

Relevant State Environmental Planning Policies and deemed SEPPs have been addressed at Attachment 7 to this report. The PP does not conflict with any of these policies.

*Q.6 Is the planning proposal consistent with applicable Ministerial Directions (S117 Directions)?*

The s117 directions applicable to the PP have been addressed at Attachment 8 of this report.

The PP would be consistent with all relevant Directions, within the exception of Direction 1.2 Rural Lands.

Direction 1.2 seeks to protect the agricultural production value of rural land. This Proposal seeks to rezone part of the RU2 Rural Landscape area to R5 Large Lot Residential, which is inconsistent with this direction. Notwithstanding this, the proposal is considered acceptable for the following reasons:

- The site is effectively isolated by anticipated neighbouring urban development, which limits the agricultural production value of the site.
- The site is already used predominantly for rural residential purposes only, and is currently occupied by a rural residential dwelling within landscaped grounds.
- The site is relatively small by agricultural standards with limited production value.
- The site neighbours' lands that were historically rural zoned land but which have since been identified for future urban development.

#### Connecting NSW: The Transport Blueprint

The priorities and targets for The Transport Blueprint include:

- Increased reliance upon public transport for trips to work;
- Improved efficiency of the road network; and
- Increased reliance upon walking and cycling.

The site is located on a major transport route (Raby Road) that provides easy access to existing and proposed centres. Raby Road has been earmarked for future upgrade which is likely to will be funded by contributions. The land is situated in proximity to a future bus route along Gledswood Hills Drive.

The site is located on an existing bus route which runs along Raby Road and provides a connection to Minto train station, and is located close to proposed bus corridors that will run through The Hermitage, The Crest, Emerald Hills, Camden Lakeside, and Eastside, and provide access to Campbelltown and the proposed Major Centre at Leppington.

For the above reasons, the provision of one (1) additional dwellings at the site is generally consistent with the Blueprint targets.

#### **5.5.1 Section C – Environmental, Social and Economic Impact**

*Q7. Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?*

Three Cumberland Plain Woodland canopy species are present but will be retained within the site following the rezoning. As such, the request for a PP is not considered to have any adverse impacts upon threatened species, population or ecological communities. This is confirmed by the Ecological Assessment submitted to support the proposal, which concludes the proposed rezoning will not impact the ecological values of the subject site.

*Q8. Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?*

The Visual Impact Assessment confirms that any visual impacts will be minor and manageable.

The site of the PP is on land which formerly contained the large hayshed associated with the rural use of the land. This structure was some 47m in length and 13m wide, with a building footprint of over 600m<sup>2</sup>. The scale of any new dwelling in this location is likely to be significantly less than this.

If and when a new building was constructed on the site of the PP, when viewed from the north it would be within a scene of low density residential, with subdivisions (DA No.2017/312) and dwellings being approved and built to the south and west of the site.

Furthermore, it is evident from further visual analysis that the site of the PP will not be visible from the "Scenic Hill" ridgeline of Raby Road to the east of the site due to existing vegetation which screens this view.

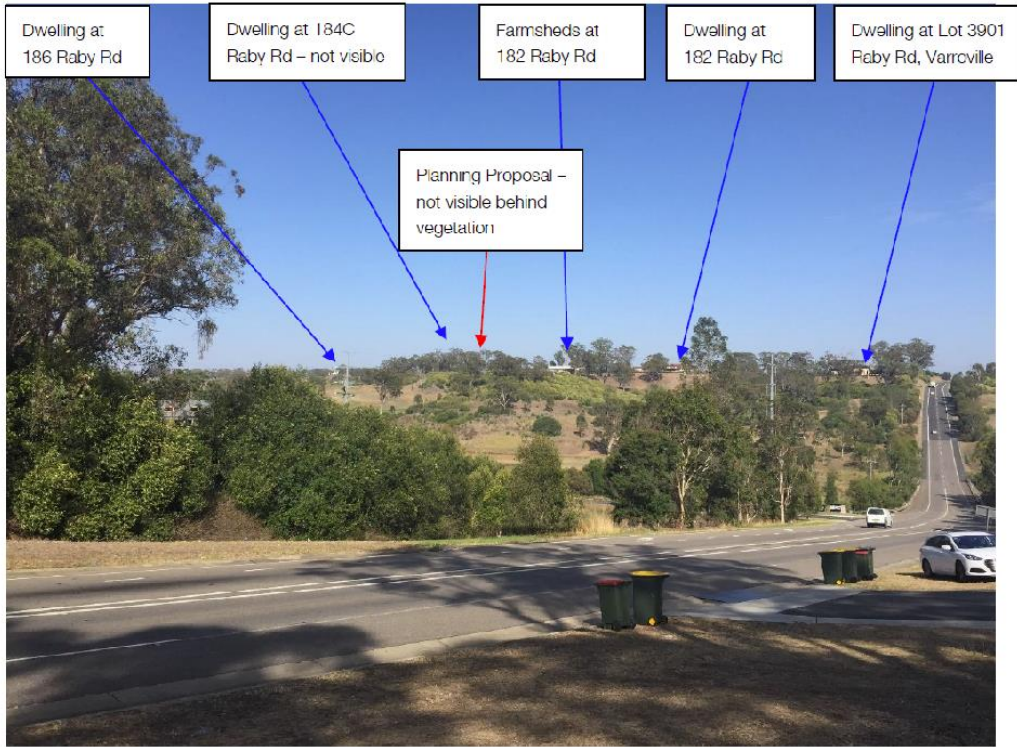


Figure 13: View looking west from Raby Road adjacent to 68 Raby Road, Varroville

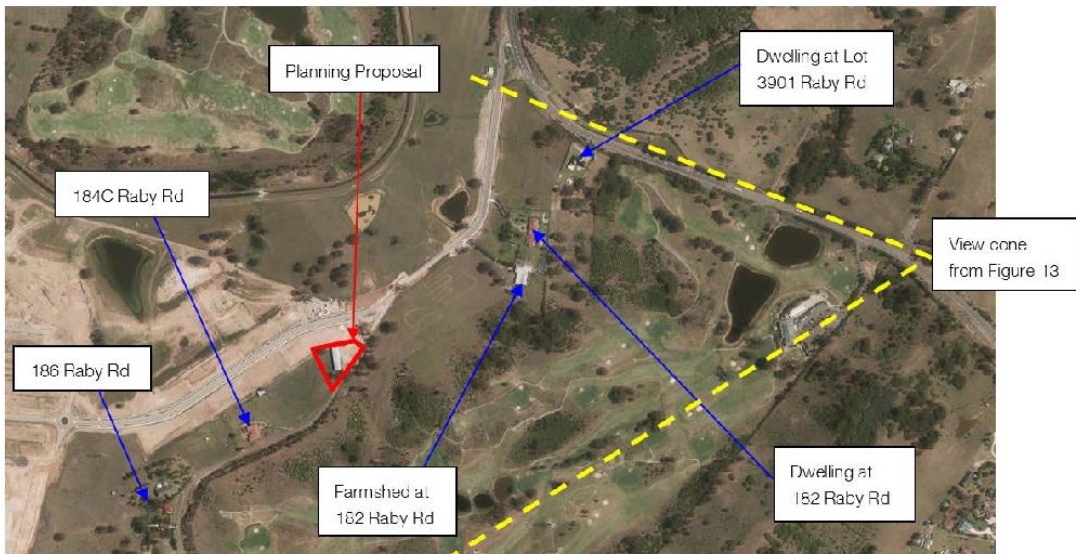


Figure 14: Aerial photography of the site and surrounds (Source: SIX Maps)

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The SCI concludes the site is suitable for the proposed development and that no further investigations or remediation works are warranted.

The site is not flood affected or bush fire prone land. In this regard, any environmental hazards that impact the site are manageable and would not preclude consideration of the proposed rezoning.

*Q9. How has the planning proposal adequately addressed any social and economic effects?*

#### Social Effects

The PP will result a minor increase in residential density. The number of additional dwellings (1) is insignificant in the context of surrounding development and is unlikely to lead to any discernible impact on community facilities earmarked for construction in nearby new release areas.

Any minor impacts on community facilities could be managed through Council's normal collection of section 94 contributions. Contributions would also be levied toward the provision of state infrastructure.

The provision of greater housing choice and diversity to meet the needs of the growing population is a potential positive impact for the community, particularly given that the site is located relatively close to future services and major employment lands.

In this regard, the PP demonstrates that the proposed rezoning accords with the relevant strategic planning framework and is likely to result in a net community benefit.

#### Economic Effects

The rezoning to allow for the subdivision of one (1) additional rural residential allotment will resolve the anomaly with the current zoning which constrains the site and essentially sterilises the R5 zone land.

The PP will provide for increased housing supply and diversity in a location with good access to nearby major employment centres. Although incremental, the economic impacts of having a stable and diverse housing supply in close proximity to employment hubs are considered positive.

*Q10 Is there adequate public infrastructure for the planning proposal?*

The locality is a highly urbanised area that is accessed by the full range of urban services and utilities. The maximisation of the residential capacity, the planning amendment and potential future redevelopment supports sound principles for utilising existing community investment in infrastructure and services in the locality. Any augmentation of utility services will be undertaken as required.

*Q11 What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway Determination?*

This section will be completed following consultation with any State and Commonwealth Public Authorities identified in the Gateway Determination.

## **5.6 Part 4 – Mapping**

This PP is supported by relevant and accurate mapping to identify land subject to the proposal, the current land use zonings that apply to the site, current development standards relating to the land, the proposed alternative zone.

For exhibition purposes, the Gateway determination may require mapping that is compliant with the DPEs technical requirements be prepared to ensure consistency with current SILEP maps. This could include a revised minimum lot size maps.

#### **5.7 Part 5 – Community Consultation**

It is expected that community consultation will be pursued consistent with standard practice of:

- Notification of surrounding land owners;
- Public notification in local newspapers; and
- Notification on Council's website.

Should further consultation be required, this can be managed through the Gateway Process.

#### **5.8 Part 6 – Project Timeline**

The project timeline will be guided by the Planning Authority. The landowner is however, committed to pursuing the Planning Proposal and completing any required studies that may arise from a Gateway Determination.

## 6.0 Conclusion and Recommendations

This Planning Proposal (PP) relates to 182 Raby Road Gledswood Hills (Lot 102 DP 1193881) and seeks to rezone a portion of land (of approximately 2797 m<sup>2</sup> in area which represents 3.9% of the total site area) at the southern end of the site from RU2 Rural Landscape to R5 Large Lot Residential.

This will increase the area of the site that is currently zoned R5 (from 2,322 m<sup>2</sup> to 5,119m<sup>2</sup>). At present, the existing R5 zoned land is 2,322m<sup>2</sup> in size and as such is less than the 4,000m<sup>2</sup> minimum lot size applicable under the Camden LEP 2010. Development of this land is severely constrained and in this regard, the PP is minor in nature and is essentially seeks to rationalise the existing zoning controls.

It will also allow for subdivision of the existing site into two (2) new lots, resulting in the creation of one (1) additional lot for large lot residential housing. This will utilise the existing 2,322 m<sup>2</sup> portion of the site that adjoins 184C Raby Road to the south-west and follows the existing subdivision pattern of rural residential housing.

The site forms part of an Urban Release Area nominated in the Camden LEP 2010. It is located approximately 1km north-east of urban development in the Turner Road Precinct, within the South West Priority Growth Area, under the Growth Centres SEPP 2006.

The development of surrounding new release areas (e.g. Turner Road, Gregory Hills, Catherine Fields and Oran Park) is delivering significant benefits and opportunities, including the creation of new residential communities, with key infrastructure and improved connections to employment and services.

The proposed lot has direct access to a Public Road (Mayfield Place) which connects to Gledswood Hills Drive. The site is located on Raby Road, approximately 3.5km north-west of the Raby Road and Hume Highway intersection, which connects to the M5 and M7 providing access to Greater Sydney.

The site is also located on an existing bus route and is located near planned future bus routes through 'The Crest' along Gledswood Hills Drive. These routes will provide access to Minto, Campbelltown and the Leppington Railway Station within the proposed Major Centre at Leppington.

The site is located in proximity to nearby retail, commercial, employment, education, community services and transport connections, presents an opportunity to augment the supply of affordable housing in South West Sydney. It also presents an opportunity to increase the usage of these new services and facilities and assist with the funding of new infrastructure.

The environmental and scenic qualities of the site and surrounding ridgelines will be maintained if a portion of the site is redeveloped with large lot residential development. Given that the locality of the site is undergoing transformation to facilitate urban development, the current RU2 Rural Landscape zoning of this portion of the site is an anomaly and clearly not the highest and best use of the land.

The submission recommends that a minor portion of the site be rezoned from RU2 Rural Landscape to R5 Large Lot Residential to allow one (1) large lot semi-rural residential allotment at the site, which is compatible with adjoining development and sympathetic to the environmental qualities of the site.

The submission provides an analysis of the constraints and the opportunities of the site. Support for this PP is based on the following:



- Infill rural residential development opportunity;
- Consistency with the adjoining development;
- Consistency with the planning framework;
- Development opportunities and constraints;
- Physical constraints that impact upon the existing lot;
- Transport and Connectivity.

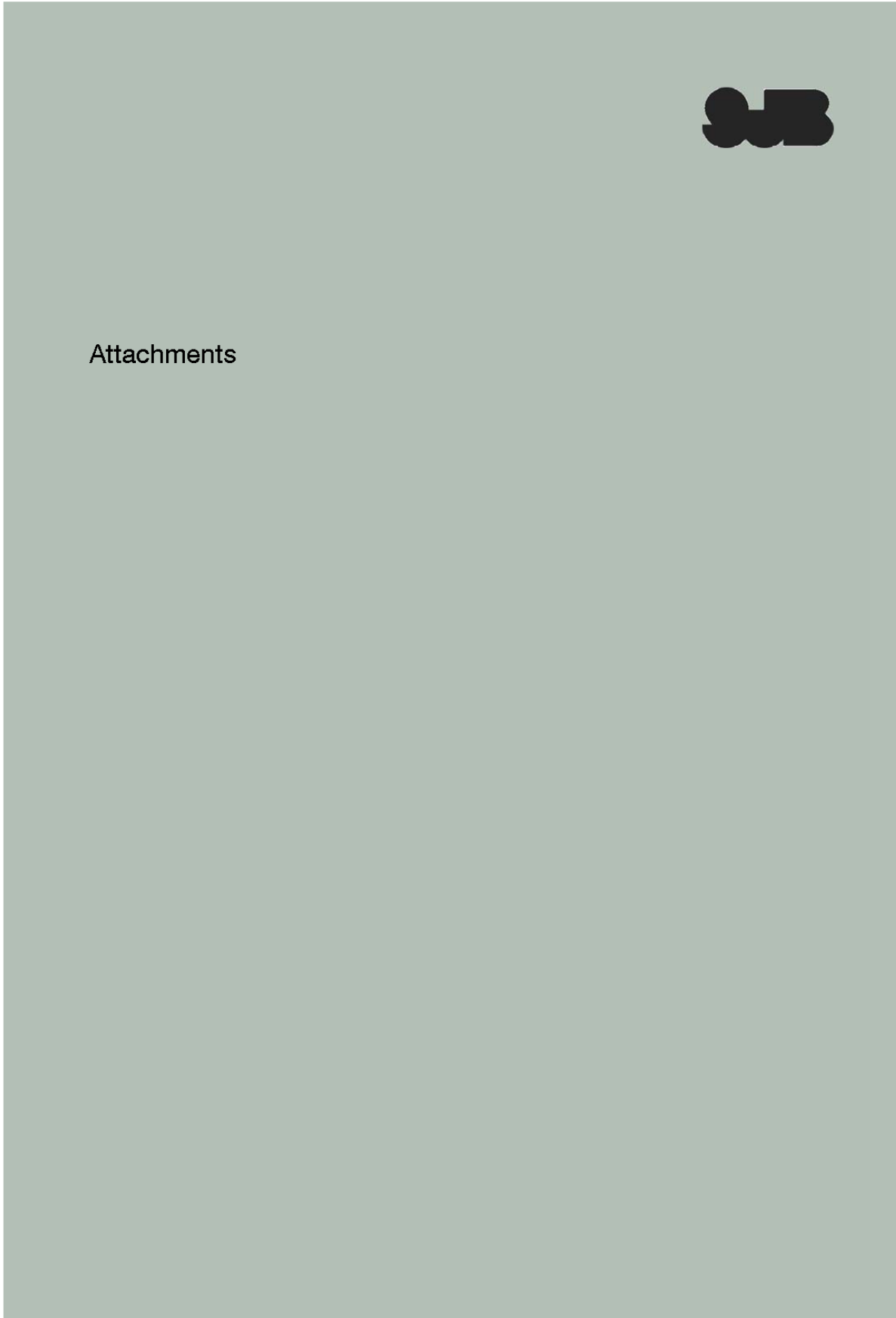
The newly created Lot will be fully serviced by a Sydney Water Sewer Main (at the rear) Water Main in Mayfield Place, and Overhead electricity in the Right of Carriageway.

The proposal is consistent with Council's recently released Rural Lands Strategy 2017.

#### Recommendations

Based on the issues addressed in this PP, it is recommended that that Camden Council resolve to support the intention of the PP and prepare a Draft LEP to amend the Camden LEP 2010 in the following way:

- Amend the Land Zoning Map to extend the application of the R5 Large Lot Residential and reduce the size of the RU2 Rural Landscape Zone in accordance with dimensions shown on the attached Plan Showing Proposed Zoning (refer to Attachment 11);
- Amend the Lot Size Map to apply a minimum lot size of 4,000m<sup>2</sup> for the R5 Large Lot Residential zone to correlate with the afore-mentioned rezoning;
- Maintain a maximum building height of 9.5m on the Height of Buildings Map.



Attachments

ORD01

Attachment 1

Attachment 1: Copy of Deposited Plan 1193881

Attachment 2: Survey Plan

**ORD01**

**Attachment 1**

Attachment 3: Existing and Proposed Zoning Plans

Attachment 4: Proposed Minimum Lot Size Map

Attachment 5: Ecological Assessment

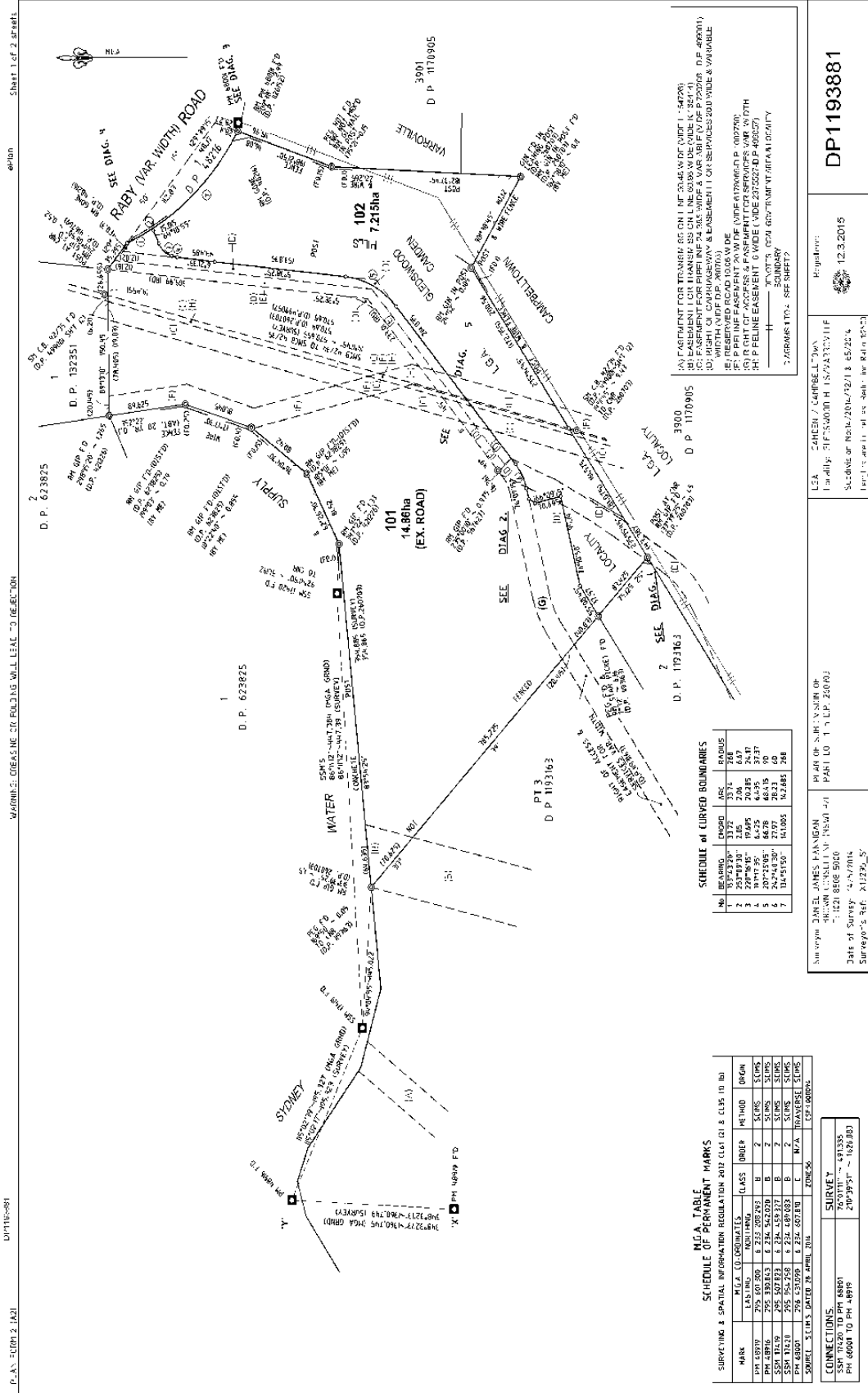
Attachment 6: Visual Impact Assessment



Attachment 7: Supplementary Contamination Investigation

Attachment 8: Consistency with State Environmental Planning Policies  
Table

Attachment 9: Compliance with Section 117 Directions Table



1. EASEMENT FOR TRANSFER OF TRAFFIC (IN 20.46 M<sup>2</sup> (VIDE 1 - 54229))  
 2. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 3. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 4. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 5. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 6. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 7. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))

**SCHEDULE OF CURVED BOUNDARIES**

No	BEARING	DROPO	ARC	RADIUS	AREA
1	85°43'30"	337.4	357.4	268	268
2	220°16'30"	16.65	202.85	24.47	24.47
3	194°17'35"	64.75	64.95	37.37	37.37
4	262°44'30"	27.97	28.23	6.0	6.0
5	104°51'30"	14.085	14.285	2.68	2.68

**M.G.A. TABLE**

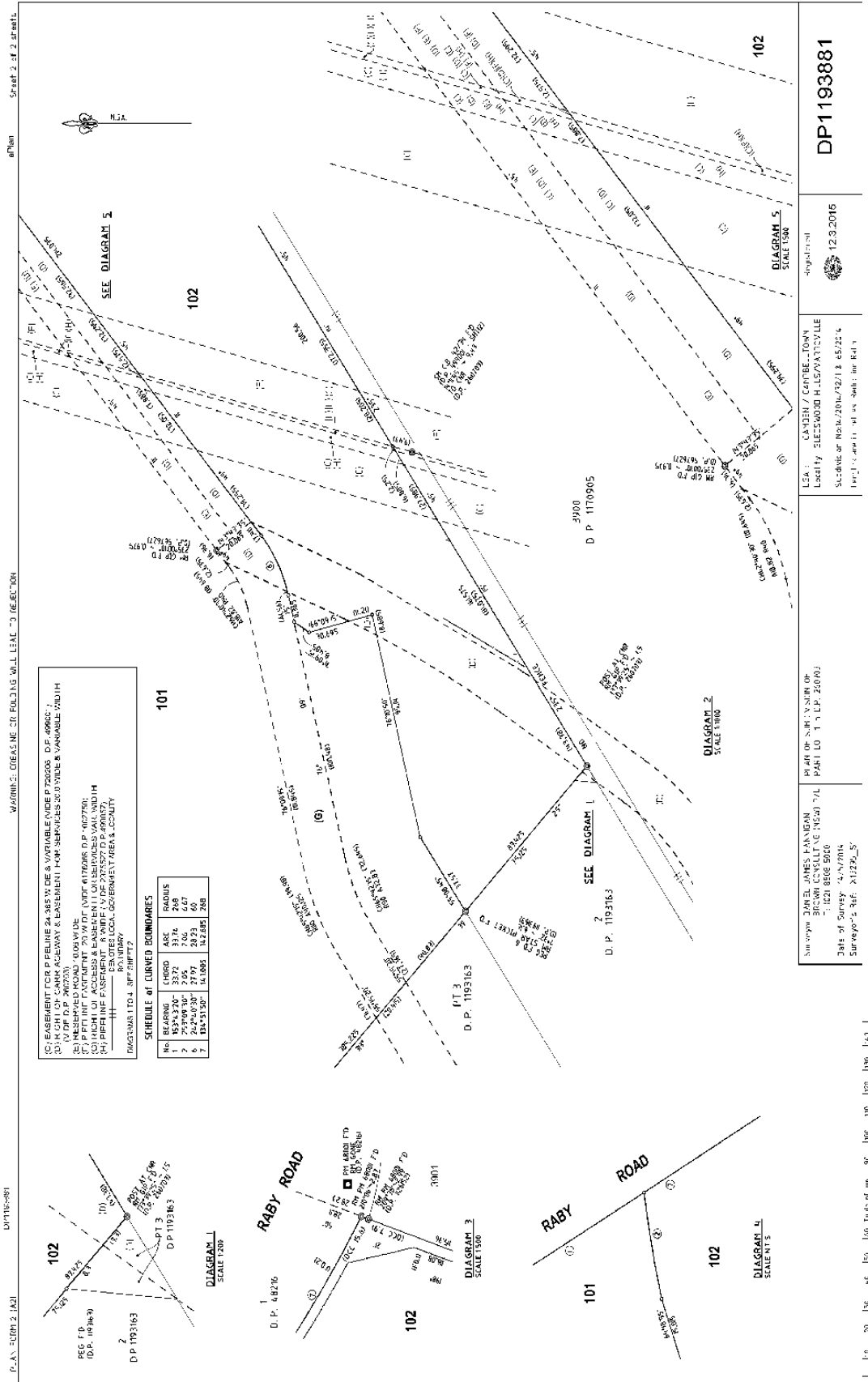
**SCHEDULE OF PERMANENT MARKS**

SURVEYING & SPATIAL INFORMATION REGULATION 2017 CLASS 101 & CLASS 103

MARK	M.G.A. CLASSIFICATION	CLASS	DIMENSION	METHOD	DEPTH
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PH 48917	205 330 843	B	234 542 209	SCIPMS	0.6M
PH 48918	205 330 843	B	234 542 209	SCIPMS	0.6M
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PH 48995	205 330 843	B	234 542 209	SCIPMS	0.6M
PH 48996	205 330 843	B	234 542 209	SCIPMS	0.6M
PH 48997	205 330 843	B	234 542 209	SCIPMS	0.6M
PH 48998	205 330 843	B	234 542 209	SCIPMS	0.6M
PH 48999	205 330 843	B	234 542 209	SCIPMS	0.6M
PH 49000	205 330 843	B	234 542 209	SCIPMS	0.6M

1. EASEMENT FOR TRANSFER OF TRAFFIC (IN 20.46 M<sup>2</sup> (VIDE 1 - 54229))  
 2. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 3. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
 4. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))  
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 7. EASEMENT FOR TRANSFER OF TRAFFIC (IN 16.03 M<sup>2</sup> (VIDE 1 - 54229))




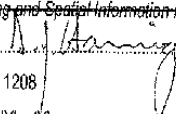
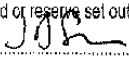
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Req:R831160 /Doc:DP 1193881 P /Rev:12-Mar-2015 /Sts:SC,OK /Pgs:ALL /Prt:05-Jun-2016 10:48 /Seq:3 of 6  
 Ref:piscuineri /Src:M

PLAN FORM 6 (2013)

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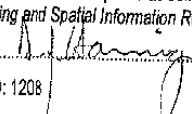
DEPOSITED PLAN ADMINISTRATION SHEET		Sheet 1 of 3 <sup>4</sup> sheet(s)
<p>Registered:  12.3.2015</p> <p>Title System: TORRENS</p> <p>Purpose: SUBDIVISION</p> <p><b>PLAN OF SUBDIVISION OF PART LOT 1 IN D.P. 260703</b></p> <p>Crown Lands NSW/Western Lands Office Approval</p> <p>I, ..... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given.</p> <p>Signature: .....</p> <p>Date: .....</p> <p>File Number: .....</p> <p>Office: .....</p>	<p style="text-align: center;">Office Use Only</p> <p style="text-align: center; font-size: 24pt;"><b>DP1193881</b></p> <p>LGA: CAMDEN AND CAMPBELLTOWN</p> <p>Locality: GLEDSDWOOD HILLS /VARROVILLE</p> <p>Parish: NARELLAN</p> <p>County: CUMBERLAND</p> <p style="text-align: center;">Survey Certificate</p> <p>I, DANIEL JAMES HANNIGAN of BROWN CONSULTING (NSW) PTY LTD (PH: 02 8808 5000) PO BOX 8300, BAULKHAM HILLS BC NSW 2153 a surveyor registered under the <i>Surveying and Spatial Information Act 2002</i>, certify that:</p> <p><i>(a) The land shown in the plan was surveyed in accordance with the Surveying and Spatial Information Regulation 2012, is accurate and the survey was completed on 14/05/2014.</i></p> <p><del><i>(b) The part of the land shown in the plan (being/excluding A.....) was surveyed in accordance with the Surveying and Spatial Information Regulation 2012, is accurate and the survey was completed on..... the part not surveyed was compiled in accordance with that Regulation.</i></del></p> <p><del><i>(c) The land shown in this plan was compiled in accordance with the Surveying and Spatial Information Regulation 2012.</i></del></p> <p>Signature:  Dated: 14/5/14</p> <p>Surveyor ID: 1208</p> <p>Datum Line: 'X' - 'Y'</p> <p>Type: Urban/Rural</p> <p>The terrain is *Level-Undulating / *Steep-Mountainous.</p> <p>*Strike through if inapplicable.</p> <p>*Specify the land actually surveyed or specify any land shown in the plan that</p>	
<p style="text-align: center;">Subdivision Certificate</p> <p>I, <u>Jeremy Swan</u></p> <p>*Authorised Person/*General Manager/*Accredited Certifier, certify that the provisions of s.109J of the <i>Environmental Planning and Assessment Act 1979</i> have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.</p> <p>Signature: </p> <p>Accreditation number: .....</p> <p>Consent Authority: <u>Camden Council</u></p> <p>Date of endorsement: <u>3 December 2014</u></p> <p>Subdivision Certificate number: <u>14/2014/72/1</u></p> <p>File number: .....</p> <p>*Strike through if inapplicable</p>	<p>Plans used in the preparation of survey/compilation.</p> <p>DP260703, DP623825, D.P. 499001, D.P. 739366, D.P. 421226, D.P. 567627, D.P. 1126152, D.P. 1170905, D.P. 48216, D.P. 1193163, D.P. 499057 D.P. 1002750, D.P. 416709</p> <p style="text-align: center;">If space is insufficient continue on PLAN FORM 6A</p>	
<p>Statements of intention to dedicate public roads create public reserves and drainage reserves, acquire/resume land.</p>	<p>Surveyor's Reference: X13295_S1</p>	
<p>Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A</p>		

Req:R831160 /Doc:DP 1193881 P /Rev:12-Mar-2015 /Sts:SC,OK /Pgs:ALL /Prt:05-Jun-2016 10:48 /Seq:4 of 6  
 Ref:piscuineri /Src:M

PLAN FORM 6 (2013)

WARNING: Creasing or folding will lead to rejection

ePlan


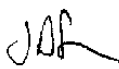
DEPOSITED PLAN ADMINISTRATION SHEET		Sheet 7 of 8 sheet(s)
<p>Registered:  12.3.2015</p> <p>Title System: TORRENS</p> <p>Purpose: SUBDIVISION</p> <p><b>PLAN OF SUBDIVISION OF PART LOT 1 IN D.P. 260703</b></p>	<p style="text-align: center;">Office Use Only</p> <p style="font-size: 2em; text-align: center;">DP1193881</p> <p style="text-align: center;">Office Use Only</p>	
<p>Crown Lands NSW/Western Lands Office Approval</p> <p>I, ..... (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given.</p> <p>Signature: .....</p> <p>Date: .....</p> <p>File Number: .....</p> <p>Office: .....</p>	<p style="text-align: center;">Survey Certificate</p> <p>I, DANIEL JAMES HANNIGAN of BROWN CONSULTING (NSW) PTY LTD (PH: 02 8808 5000) PO BOX 8300, BAULKHAM HILLS BC NSW 2153 a surveyor registered under the <i>Surveying and Spatial Information Act 2002</i>, certify that:</p> <p>*(a) The land shown in the plan was surveyed in accordance with the <i>Surveying and Spatial Information Regulation 2012</i>, is accurate and the survey was completed on <u>14/5/2014</u></p> <p>*(b) The part of the land shown in the plan ("being" excluding ^ ..... ) was surveyed in accordance with the <i>Surveying and Spatial Information Regulation 2012</i>, is accurate and the survey was completed on ..... the part not surveyed was compiled in accordance with that Regulation.</p> <p>*(c) The land shown in this plan was compiled in accordance with the <i>Surveying and Spatial Information Regulation 2012</i>.</p> <p>Signature:  Dated: <u>14/5/14</u></p> <p>Surveyor ID: 1208</p> <p>Datum Line: 'X' - 'Y'</p> <p>Type: *Urban/*Rural</p> <p>The terrain is *Level-Undulating / *Steep-Mountainous.</p> <p>*Strike through if inapplicable.</p> <p>*Specify the land actually surveyed or specify any land shown in the plan that</p>	
<p style="text-align: center;">Subdivision Certificate</p> <p>I, <u>BRENDAN LEO</u> *Authorised Person/*General Manager/*Accredited Certifier, certify that the provisions of s.108J of the <i>Environmental Planning and Assessment Act 1979</i> have been satisfied in relation to the proposed subdivision, new road or reserve set out herein.</p> <p>Signature: <u>Brendan Leo</u></p> <p>Accreditation number: .....</p> <p>Consent Authority: <u>Campbelltown City Council</u></p> <p>Date of endorsement: <u>1 Dec 2014</u></p> <p>Subdivision Certificate number: <u>65 of 2014</u></p> <p>File number: <u>492/2014</u></p> <p>*Strike through if inapplicable.</p>	<p>Plans used in the preparation of survey/compilation. DP260703</p> <p style="text-align: right;">If space is insufficient continue on PLAN FORM 6A</p>	
<p>Statements of intention to dedicate public roads create public reserves and drainage reserves, acquire/resume land.</p>	<p>Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A</p> <p>Surveyor's Reference: X13295_S1</p>	

Req:R831160 /Doc:DP 1193881 P /Rev:12-Mar-2015 /Sts:SC,OK /Pgs:ALL /Prt:05-Jun-2016 10:48 /Seq:5 of 6  
Ref:piscuineri /Src:M

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PLAN FORM 6A (2012)

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DEPOSITED PLAN ADMINISTRATION SHEET		Sheet <sup>3 4</sup> 2 of 2 sheet(s)
Office Use Only	Office Use Only	<h1>DP1193881</h1>
Registered:  12.3.2015		
PLAN OF SUBDIVISION OF PART LOT 1 IN D.P. 260703		<p>This sheet is for the provision of the following information as required:</p> <ul style="list-style-type: none"> <li>• A schedule of lots and addresses - See 60(c) SSI Regulation 2012</li> <li>• Statements of intention to create and release affecting interests in accordance with section 88B Conveyancing Act 1919</li> <li>• Signatures and seals- see 195D Conveyancing Act 1919</li> <li>• Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.</li> </ul>
Subdivision Certificate number: 14/2014/22/1(A) Date of Endorsement: 3/12/2014		
(A) 65/2014 DATED 1/12/2014 STREET ADDRESSES FOR ALL LOTS - NOT AVAILABLE		
PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT 1919, IT IS INTENDED TO CREATE:		
<ol style="list-style-type: none"> <li>1. RIGHT OF ACCESS VARIABLE WIDTH (G)</li> <li>2. EASEMENT FOR SERVICES VARIABLE WIDTH (G)</li> </ol>		
		
If space is insufficient use additional annexure sheet		
Surveyor's Reference: X13295_S1		



ORD01


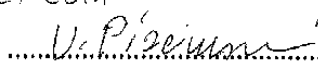

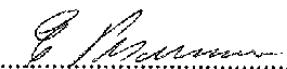
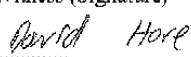

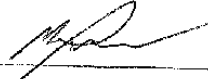
Attachment 1

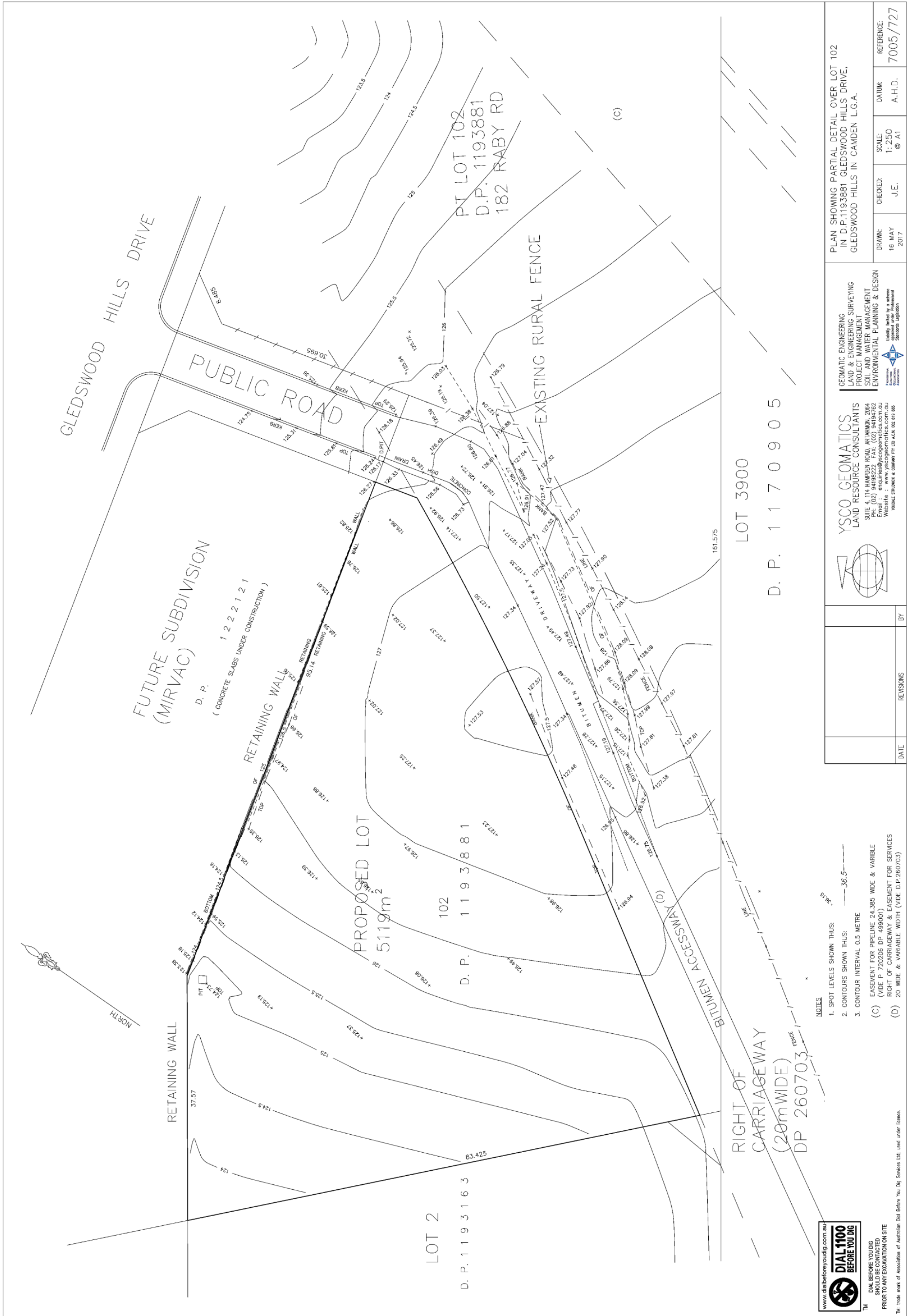
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Ref:piscuineri /Src:M

PLAN FORM 6A (2012)

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DEPOSITED PLAN ADMINISTRATION SHEET		Sheet <sup>44</sup> 3 of 2 sheet(s)
Registered:  12.3.2015	Office Use Only	Office Use Only
PLAN OF SUBDIVISION OF PART LOT 1 IN D.P. 260703		<p>This sheet is for the provision of the following information as required:</p> <ul style="list-style-type: none"> <li>A schedule of lots and addresses - See 60(c) <i>SSI Regulation 2012</i></li> <li>Statements of intention to create and release affecting interests in accordance with section 88B <i>Conveyancing Act 1919</i></li> <li>Signatures and seals- see 195D <i>Conveyancing Act 1919</i></li> <li>Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.</li> </ul>
Subdivision Certificate number: 14/2014/72/1(A) Date of Endorsement: 3/12/2014		
(A) 65/2014 DATED: 1/12/2014		
Executed by Vincenzo Piscuineri In the presence of:  Vincenzo Piscuineri		
Witness (Signature)  David Hore Witness (Please Print)		
105/6 Cowper Wharf Road, Woollomooloo, 2011 Address (Please Print)		
Executed by Elizabeth Piscuineri In the presence of:  Elizabeth Piscuineri		
Witness (Signature)  David Hore Witness (Please Print)		
105/6 Cowper Wharf Road, Woollomooloo 2011 Address (Please Print)		
EXECUTED BY MORTGAGE FOR ST. GEORGE BANK,		SIGNED SEALED AND DELIVERED for and on behalf of ST. GEORGE BANK - A DIVISION OF WESTPAC BANKING CORPORATION ABN 33 007 457 141 by its attorney under power of attorney dated 17 January 2001 registration book 4209 no 322 In the presence of:  Medhat Rafael Account Manager
If space is insufficient use additional annexure sheet		 Mark Gunn Senior Manager
Surveyor's Reference: X13295_S1		



- NOTES**
1. SPOT LEVELS SHOWN THUS: 36.5
  2. CONTOURS SHOWN THUS: 36.5
  3. CONTOUR INTERVAL 0.5 METRE
- (C) EASEMENT FOR PIPELINE 24.385 WIDE & VARIABLE (VIDE P. 720206 DP 409001)  
 (D) 20 WIDE & VARIABLE WIDTH (VIDE D.P. 260703)

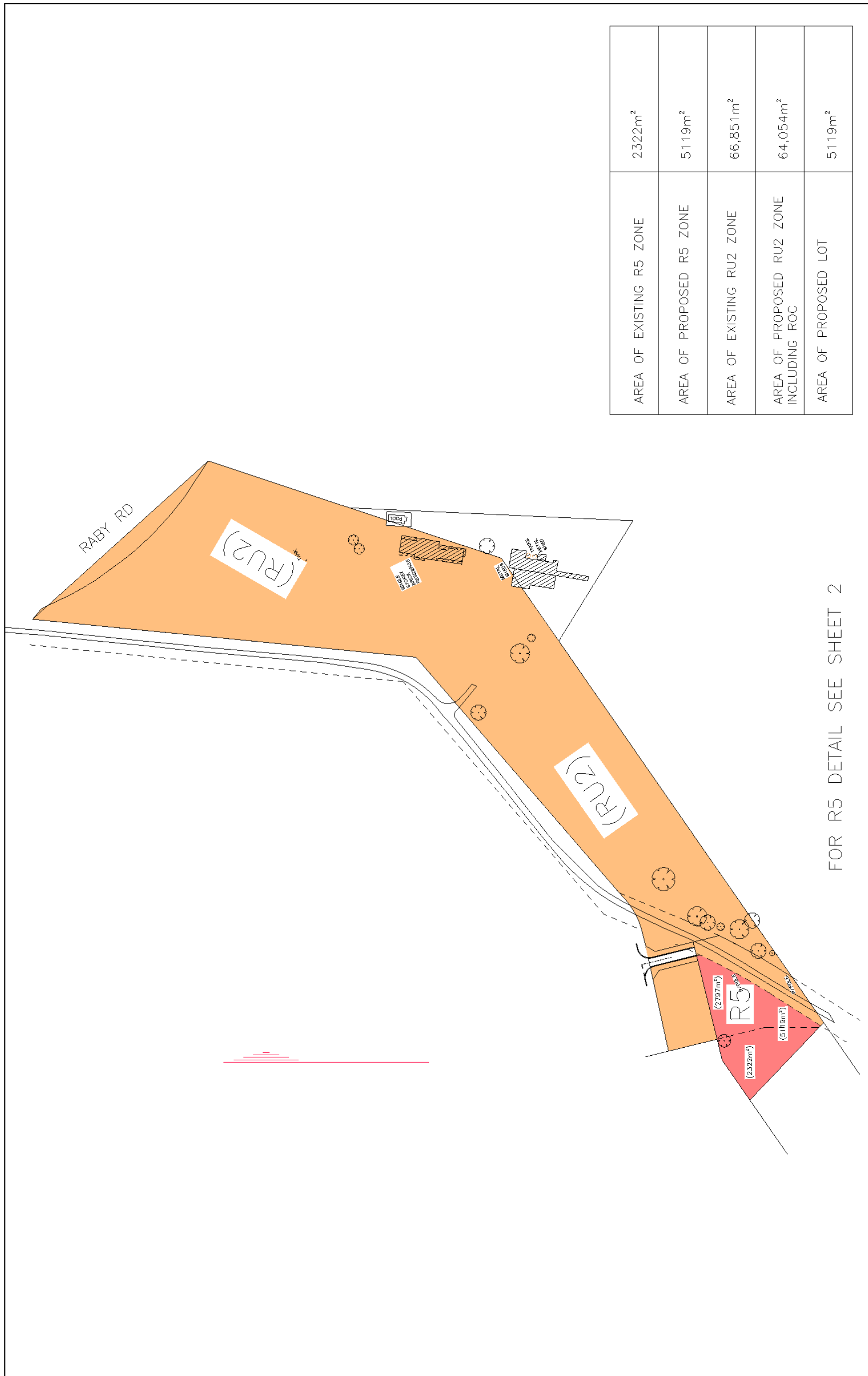
DATE	REVISIONS	BY

**YSCO GEOMATICS**  
 LAND RESOURCE CONSULTANTS  
 SUITE 4, 114 HAMPSHIRE ROAD, ARTARMON, 2084  
 NSW  
 Email: [enquiries@yscogeomatics.com.au](mailto:enquiries@yscogeomatics.com.au)  
 Website: [www.yscogeomatics.com.au](http://www.yscogeomatics.com.au)  
 YOUNG STRONACH & COMPANY PTY LTD A/CN 102 818 805

**GEOMATIC ENGINEERING**  
 LAND & ENGINEERING SURVEYING  
 PROJECT MANAGEMENT  
 SOIL AND WATER MANAGEMENT  
 ENVIRONMENTAL PLANNING & DESIGN  
 Liability limited by a statute approved under professional supervision

PLAN SHOWING PARTIAL DETAIL OVER LOT 102  
 IN D.P. 1193881 GLEDSDOOD HILLS DRIVE,  
 GLEDSDOOD HILLS IN CAMDEN L.G.A.

DRAWN:	CHECKED:	SCALE:	DATE:	REFERENCE:
16 MAY 2017	J.E.	1:250 @ A1	A.H.D.	7005/727



AREA OF EXISTING R5 ZONE	2322m <sup>2</sup>
AREA OF PROPOSED R5 ZONE	5119m <sup>2</sup>
AREA OF EXISTING RU2 ZONE	66,851m <sup>2</sup>
AREA OF PROPOSED RU2 ZONE INCLUDING R5	64,054m <sup>2</sup>
AREA OF PROPOSED LOT	5119m <sup>2</sup>

**A**  
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**DIAL 1100**

**YSCO GEOMATICS**  
LAND RESOURCE CONSULTANTS  
SUITE 4, 114 HAMPTON ROAD, ARTARMON, 2064  
Ph: (02) 94192226 Fax: (02) 94194762  
Email: [info@yscogeomatics.com.au](mailto:info@yscogeomatics.com.au)  
Website: [www.yscogeomatics.com.au](http://www.yscogeomatics.com.au)  
YSCOGEO & COMPANY PTY LTD ACN 602 519 088

**PLAN SHOWING PROPOSED ZONING**  
**182A RABY RD GLEDSDOOD**

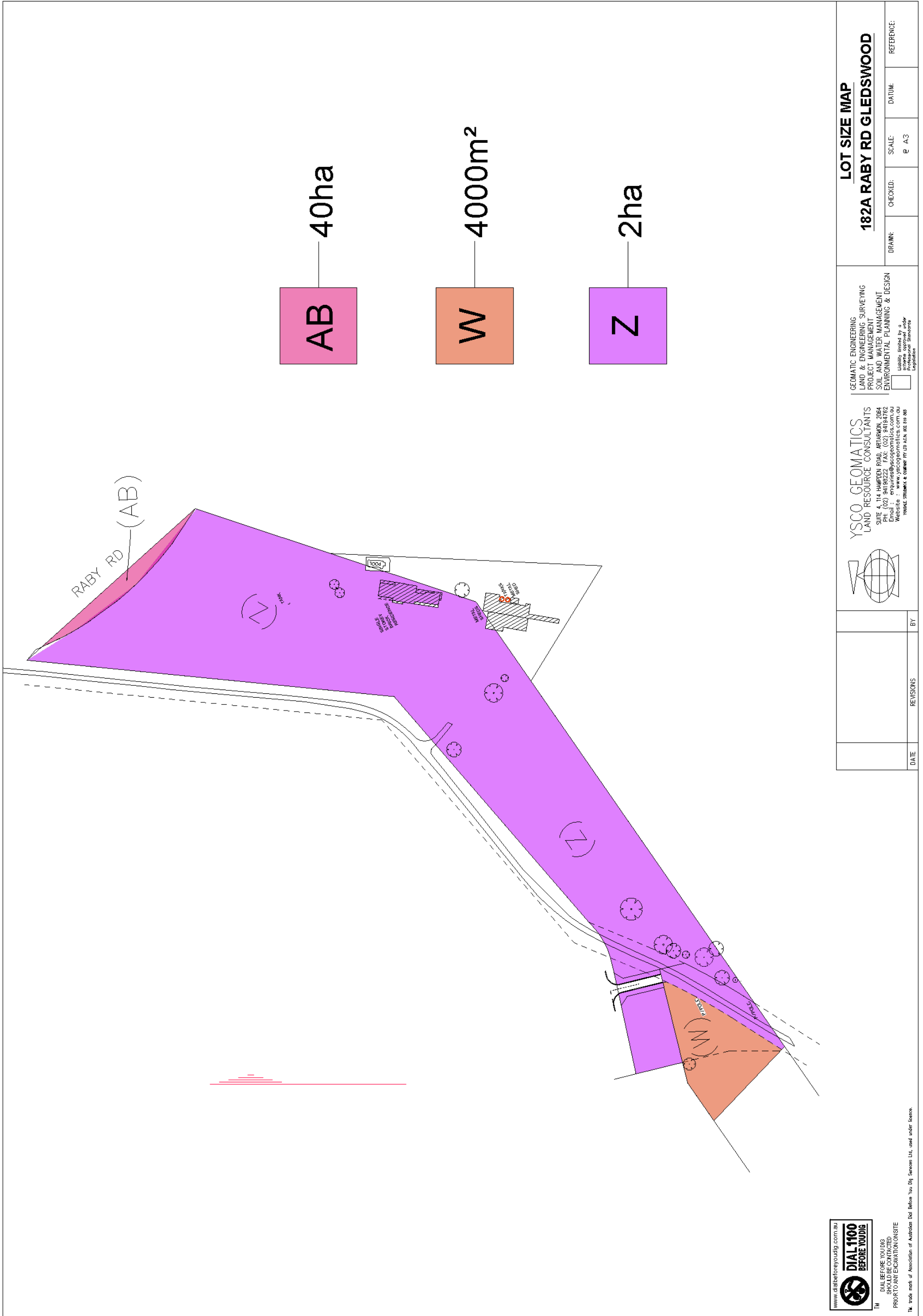
GEOMATIC ENGINEERING  
LAND & ENGINEERING SURVEYING  
PROJECT MANAGEMENT  
SOIL AND WATER MANAGEMENT  
ENVIRONMENTAL PLANNING & DESIGN  
Leads, issued by a  
scheme approved under  
Legislation

DRAWN:	CHECKED:	SCALE:	DATUM:	REFERENCE:
		@ A3		

REVISIONS

DATE	BY

SHEET 2 OF 3



**YSCO GEOMATICS**  
 LAND RESOURCE CONSULTANTS  
 SITE 4/11 HARPER ROAD, ACTON NSW 2044  
 Ph: (02) 9339 4444  
 Email: enquiries@yscogeomatics.com.au  
 Website: www.yscogeomatics.com.au  
 YSCOG 52000024 & 52000025 PT 1/3 ACN 602 519 088

GEOMATIC ENGINEERING  
 LAND & ENGINEERING SURVEYING  
 PROJECT MANAGEMENT  
 SOIL AND WATER MANAGEMENT  
 ENVIRONMENTAL PLANNING & DESIGN  
 Quality limited by a  
 scheme approved under  
 the Environmental Protection  
 Legislation

LOT SIZE MAP			
182A RABY RD GLEDSDWOOD			
DRAWN:	CHECKED:	SCALE:	DATUM:
		1: A3	
			REFERENCE:

DATE	REVISIONS	BY



The consideration of these State Environmental Planning Policies and deemed SEPPs has identified that the Planning Proposal does not conflict with any of these policies:

SEPP Title	Consistency	Comment
19. Bushland in Urban Areas	Yes	The proposal does not have any adverse impacts upon urban bushland.
44. Koala Habitat Protection	Yes	The site does not include potential koala habitat.
55. Remediation of Land	Yes	The site has been the subject of a supplementary contamination investigation (SCI) (Attachment 6).  The SCI confirms that, consistent with Clause 6 of SEPP 55, the site is considered suitable for the proposed rezoning to allow for residential subdivision.
64. Advertising and Signage	N/A	Should the PP proceed future development would be subject to the provisions of this SEPP.
65. Design Quality of Residential Flat Development	Yes	Residential flats are prohibited in the R5 – Large Lot Residential Zone.
SEPP (Building Sustainability Index: BASIX) 2004	Yes	This SEPP is relevant to specific development that would be permitted on the land. Future development would need to comply with these provisions.
SEPP (Housing for Seniors or People with a Disability) 2004	Yes	Seniors housing is prohibited in the R5 – Large Lot Residential Zone.
SEPP (Infrastructure) 2007	Yes	This SEPP is relevant to particular development categories. This Planning Proposal does not derogate or alter the application of the SEPP to future development.
SEPP (Exempt and Complying Development Codes) 2008	Yes	This SEPP is relevant to particular development categories. This Planning Proposal does not derogate or alter the application of the SEPP to future development.
SEPP (Affordable Rental Housing) 2009	Yes	This SEPP is relevant to particular forms of development. This Planning Proposal does not derogate or alter the application of the SEPP to future development.
SREP (Sydney Harbour Catchment) 2005	Yes	Consideration of this deemed SEPP will continue to apply relating to management of water quality entering the Sydney Harbour Catchment.

Table 1: Consistency of the Planning Proposal with SEPP titles

The Planning Proposal would be consistent with all relevant Directions as detailed below:

S117 Direction Title	Consistency	Comment
<b>1.0 Employment and Resources</b>		
1.1 Business and Industrial Zones	N/A	
1.2 Rural Zones	N/A	
1.3 Mining, Petroleum Production and Extractive Industries	N/A	
1.4 Oyster Aquaculture	N/A	
1.5 Rural Lands	N/A	Direction 1.5 for Rural Lands does not apply in the Camden LGA.
<b>2.0 Environment and Heritage</b>		
2.1 Environment Protection Zones	Yes	The Planning Proposal does not propose the introduction of an Environmental Protection zone.
2.2 Coastal Protection	N/A	
2.3 Heritage Conservation	Yes	There are no known matters of heritage significance required to be considered for the site and there are no heritage items located on the site.
2.4 Recreation Vehicle Areas	N/A	
<b>3.0 Housing, Infrastructure and Urban Development</b>		
3.1 Residential Zones	N/A	
3.2 Caravan Parks and Manufactured Home Estates	N/A	
3.3 Home Occupations	Yes	Home occupations will continue to be permitted, to be carried out in dwelling houses without the need for development consent.
3.4 Integrating Land Use and Transport this Ministerial Direction	N/A	
3.5 Development Near Licensed Aerodromes	N/A	
3.6 Shooting Ranges	N/A	
<b>4.0 Hazard and Risk</b>		
4.1 Acid Sulphate Soils	Yes	The area is not subject to potential acid sulfate soils.
4.2 Mine Subsidence and Unstable Land	N/A	
4.3 Flood Prone Land	N/A	
4.4 Planning for Bushfire Protection	N/A	
<b>5.0 Regional Planning</b>		
5.1 Implementation of Regional Strategies	N/A	
5.2 Sydney Drinking Water Catchments	N/A	
5.3 Farmland of State and Regional Significance on the NSW Far North Coast	N/A	
5.4 Commercial and Retail Development along the Pacific Highway, North Coast	N/A	
5.8 Second Sydney Airport: Badgerys Creek	N/A	

5.9 North West Rail Link Corridor Strategy	N/A	
5.10 Implementation of Regional Plans	Yes	The Planning Proposal is consistent with the draft Regional Plan which seek to increase density and provide additional housing choice.
<b>6.0 Local Plan Making</b>		
6.1 Approval and Referral Requirements	Yes	The Planning Proposal is consistent with this Ministerial Direction.
6.2 Reserving Land for Public Purposes	N/A	
6.3 Site Specific Provisions	N/A	
<b>7.0 Metropolitan Plan Making</b>		
7.1 Implementation of the Metropolitan Strategy	Yes	The Planning Proposal is consistent with the relevant actions from A Plan for Growing Sydney and the Draft District Plan as detailed within this submission.

Table 1: Consistency of the Planning Proposal with Ministerial Directions

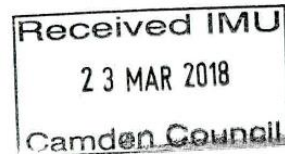


SJB Planning



Camden Council  
PO Box 183  
Camden NSW 2570

Attn: Heath James / Mary-Anne Madden



19 March 2018

Re: Planning Proposal – Lot 102 DP 1193881 at 182 Raby Road, Gledswood Hills

Dear Heath and Mary-Anne,

We refer to your correspondence dated 31 January 2018 and our subsequent meeting on site on 14 February 2018 in relation to the Planning Proposal for Lot 102 DP 1193881, known as 182 Raby Road, Gledswood Hills.

We note that the abovementioned correspondence raises the following issues:

1. Demonstrate the locality of adjacent ridgelines relative to the subject site in the Visual Impact Assessment (VIA).
2. Provide a copy of the visual analysis study by LFA (Pacific) Pty Ltd referred to in the VIA for the subject proposal.
3. There are inconsistencies between the proposal and the supporting technical studies in relation to the area of the proposed R5 zone. It is requested that the proposal and studies provide a clear indication of the size of the proposed R5 area. Specific attention is drawn to Figures 3 and 4 in the Ecological Assessment and Figure 8 in the VIA.

We also refer to your subsequent correspondence of 27 February 2018, which provided meeting notes and a summary of the actions outstanding:

1. Update the VIA with justification regarding no visual impact to Scenic Hills and no detrimental visual impact within Camden LGA.
2. Diagram of existing buildings, likely future buildings on approved subdivisions and an indicative house on the proposed lot – to show will be in keeping with surrounding area.
3. Updated justification within the Planning Proposal outlining that the proposal is a logical extension to the urban zone and the proposed lot is separate from the family holding.
4. Applicant to provide a photo of the shed that previously existed on the site, if possible.

We have reviewed Council's correspondence and write to provide further information as requested. Please find attached a response to these issues and the following attachments:

1. Revised Planning Proposal dated March 2018 prepared by SJB Planning.
2. Revised Ecological Assessment dated 28 February 2018 prepared by Eco Logical Australia Pty Ltd.
3. A copy of the Addendum Map to visual analysis study by LFA (Pacific) Pty Ltd forwarded to Council on 6 February 2018.

7864\_3\_1\_L001\_RFI Response\_180319

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Should you wish to discuss any of the above matters, please do not hesitate to contact me on (02) 9380 9911 or by email at mbaker@sjb.com.au.

Yours sincerely



Michael Baker  
Associate Director

7894\_3\_1\_L001\_RFI Response\_180319

**Response to Issues raised in correspondence dated 31 January 2018**

1. *Demonstrate the locality of adjacent ridgelines relative to the subject site in the Visual Impact Assessment (VIA).*

Response:

The location of the adjacent ridgelines was demonstrated at our site meeting of 14 February 2018, at which point it was acknowledged that there is a ridgeline further to the east of the site on the eastern side of the Macarthur Grange Country Club.

2. *Provide a copy of the visual analysis study by LFA (Pacific) Pty Ltd referred to in the VIA for the subject proposal.*

Response:

A copy of the requested visual analysis study by LFA (Pacific) Pty Ltd and subsequent addendums was forwarded to Joyce Jiang of Council on 6 February 2018.

3. *There are inconsistencies between the proposal and the supporting technical studies in relation to the area of the proposed R5 zone. It is requested that the proposal and studies provide a clear indication of the size of the proposed R5 area. Specific attention is drawn to figures 3 and 4 in the Ecological Assessment and figure 8 in the VIA.*

Response:

Please find attached a revised Ecological Assessment dated 28 February 2018, which corrects the inconsistencies between the initial version and the Planning Proposal.

**Response to Issues raised in correspondence dated 27 February 2018**

1. *Update the VIA with justification regarding no visual impact to Scenic Hills and no detrimental visual impact within Camden LGA.*

The Planning Proposal, which should enable the creation of one (1) additional large residential lot will have a negligible visual impact on Scenic Hills and within the Camden LGA for the following reasons:

Proposed on site of former hayshed

Any future dwelling house constructed on the site of the proposal will be located in an area that has historically been the site of a large hayshed, used as part of the previous rural use of the site. An aerial photograph of the hayshed structure is provided in Figure 1.

The aerial photograph at Figure 1 provides evidence of the size and footprint of the hayshed that was previously located on the site. The hayshed was approximately 47m in length and 13m wide with a building footprint of approximately 611m<sup>2</sup>. When compared with the scale of the neighbouring dwelling (refer to the bottom left hand corner of Figure 1), it is acknowledged that the hayshed that previously stood on the site was of a considerable scale and form. It was demolished in 2017 to facilitate the adjoining Mirvac subdivision as the hayshed was located partly within the adjoining Mirvac land and furthermore was separated from the remainder of the family landholding by the private road which provides access through to 184-188 Raby Road to the south.

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**SJB Planning**

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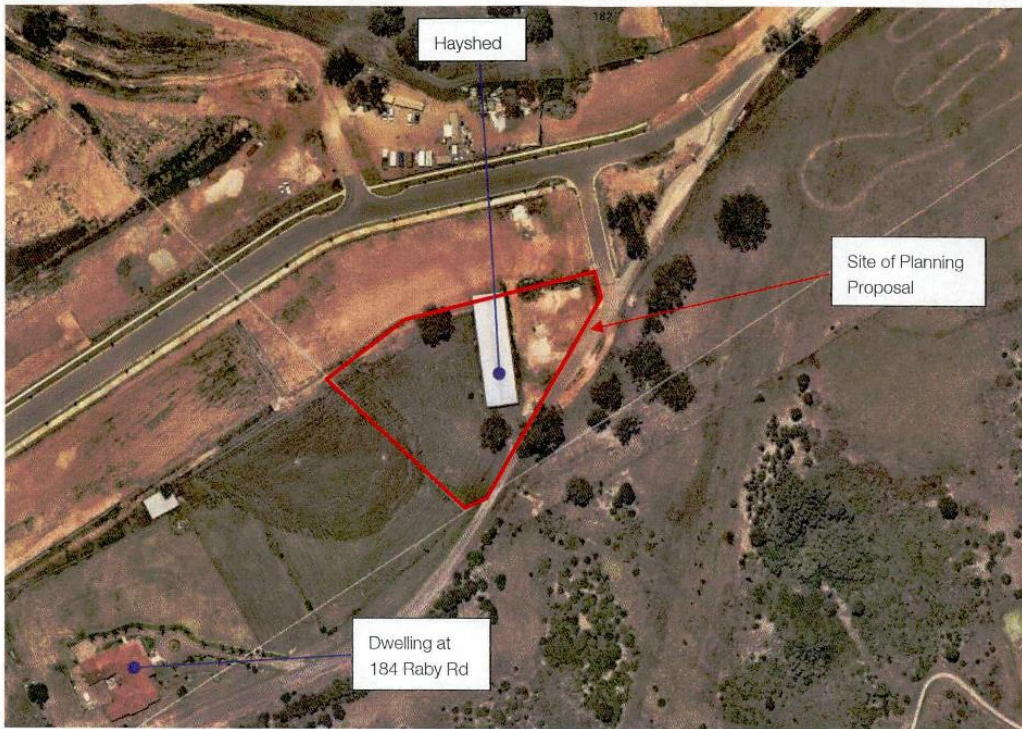


Figure 1: Aerial photograph of 17 Jan 2017 (Source: www.maps.au.nearmap.com)

In this respect, the visual character of this part of the site has been historically dominated by a large timber and corrugated iron structure. This Planning Proposal would enable the subdivision of one additional lot with a minimum lot size of 4,000m<sup>2</sup>.

The construction of a dwelling house on this lot and site of the former hayshed will have a lesser impact on the visual landscaped character than what the hayshed would have historically had.

Development to the south and west will comprise urban development

The site of the Planning Proposal is on the fringe of the surrounding urban development with urban development with R5 Large Lot Residential development permitted on part of the site and to the south-west, which is No.184B and 184C Raby Road, which has recently obtained approval for a seven (7) large lot residential subdivision.

Furthermore, the timber paling fence of the adjoining R2 Low Density Residential abuts part of the site along the western boundary. This is illustrated in Figure 2.

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Figure 2: Aerial photograph dated 21 January 2018 (Source: maps.au.nearmap.com)

Location of Second Ridge

A second ridge exists to the east of the site on the eastern side of Macarthur Range Golf Club which separates the site from the residential properties to the east within the Campbelltown LGA, meaning there is limited visibility from the east.

Visibility from Scenic Hills

The location of the Planning Proposal and proposed lot is not visible from the ridge on the eastern side of Macarthur Range Golf Club, as was evident from our site meeting, and the photo at Figure 3.

It is evident from the photograph taken from Raby Road looking east toward the site, adjacent to No.68 Raby Road, Varroville that the location of the Planning Proposal cannot be seen – refer to Figure 3.

The aerial photograph at Figure 4 identifies the location from which the photograph at Figure 3 was taken from and identifies the key structures and land uses in the photograph.

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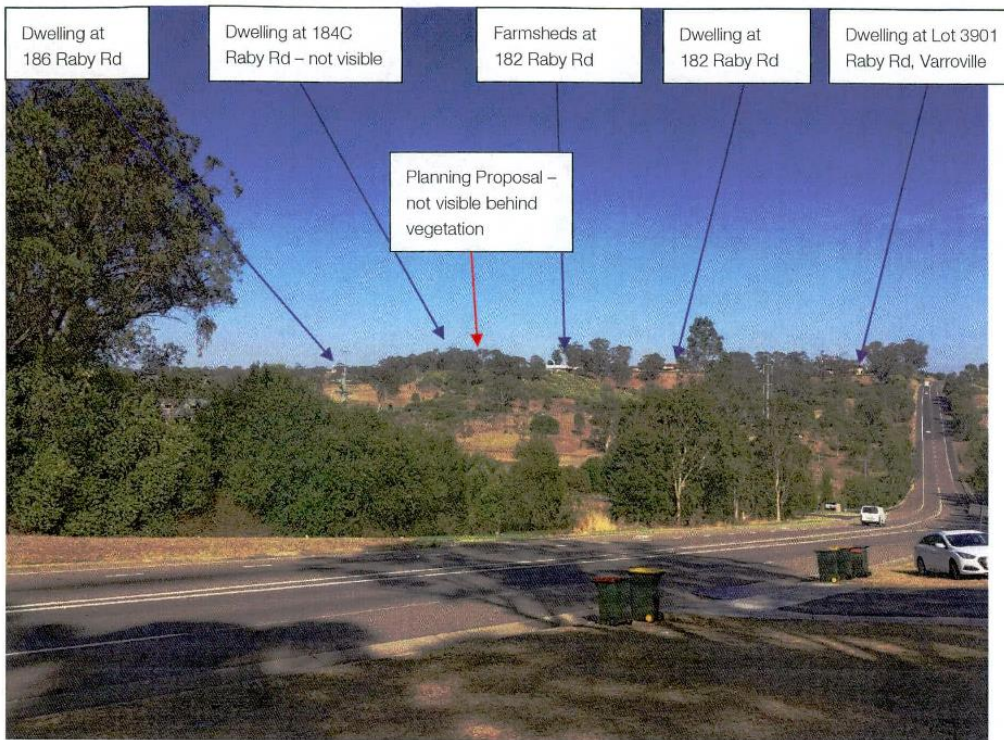


Figure 3: View looking west from Raby Road adjacent to 68 Raby Road, Varroville

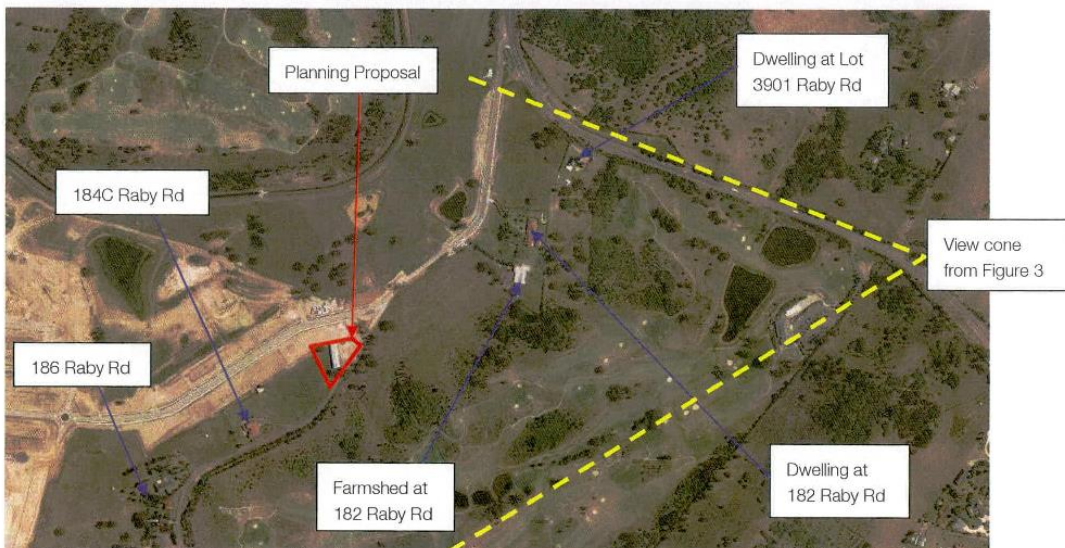


Figure 4: Aerial Photograph of the site and surrounds (Source: www.sixmaps.nsw.gov.au)

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2. Diagram of existing buildings, likely future buildings on approved subdivisions and an indicative house on the proposed lot – to show will be in keeping with surrounding area.

When viewing the site from the north, adjacent to the Gledswood Hills Drive and Raby Road intersection, Council staff requested a diagram or sketch identifying the existing building and location of the future building on approved subdivisions. The photograph at Figure 5 illustrates the view from this current location.

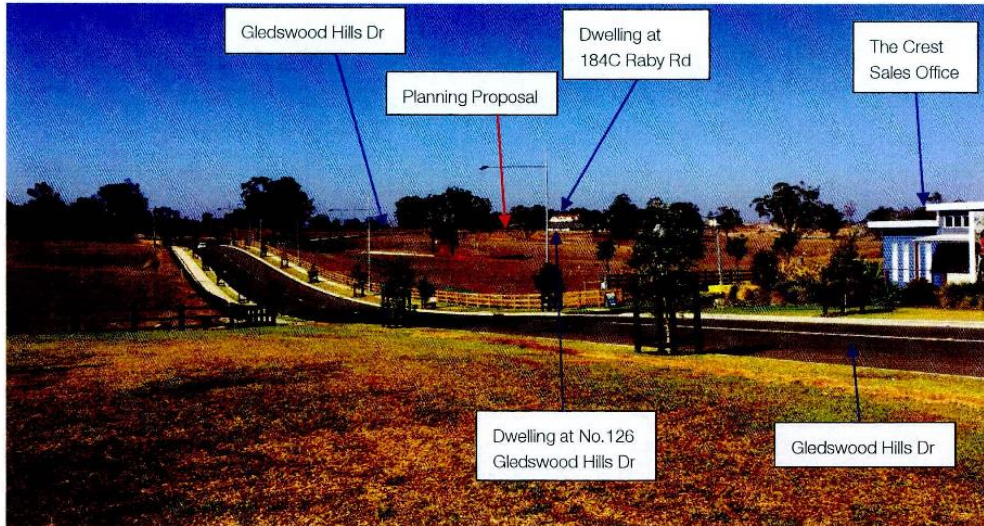


Figure 5: View looking south from the intersection of Gledswood Hills Drive and Raby Road

The photograph of the view looking south toward the Planning Proposal from the Gledswood Hills Drive/Raby Road intersection in Figure 5 comprises:

- Gledswood Hills Drive in the centre of the photo heading south west, before turning in a westerly direction;
- Former rural grazing land on the right of photo – west of Gledswood Hills Drive, now zoned RE2 Private Recreation, with the Crest Sales Office in the foreground and the urban development on the ridge in the background;
- The black fenced land on the left of photo being 182 Raby Road zoned RU2 Rural landscape;
- Centre of photo the location of the Planning Proposal south of Gledswood Hills Drive and the associated dwellings currently being constructed on either side of Gledswood Hills Drive;
- The cream coloured walls and terracotta roofed dwelling centre of photo on the ridge being 184C Raby Road, which is zoned R5 Large Lot Residential, which has recently been approved for re-subdivision with 184B Raby Road (not visible in photo) for subdivision into seven (7) large residential lots.

The sketch at Figure 6 highlights these key features and the location of the Planning Proposal. The sketch has not endeavoured to show a dwelling on the site of the Planning Proposal, nor the two future dwellings to be built on the two new lots approved between the dwelling at No.184C Raby Road and the site of the Planning Proposal, as these dwellings will largely be obscured from view by the existing tree and paling fence that sit forwards of this land.

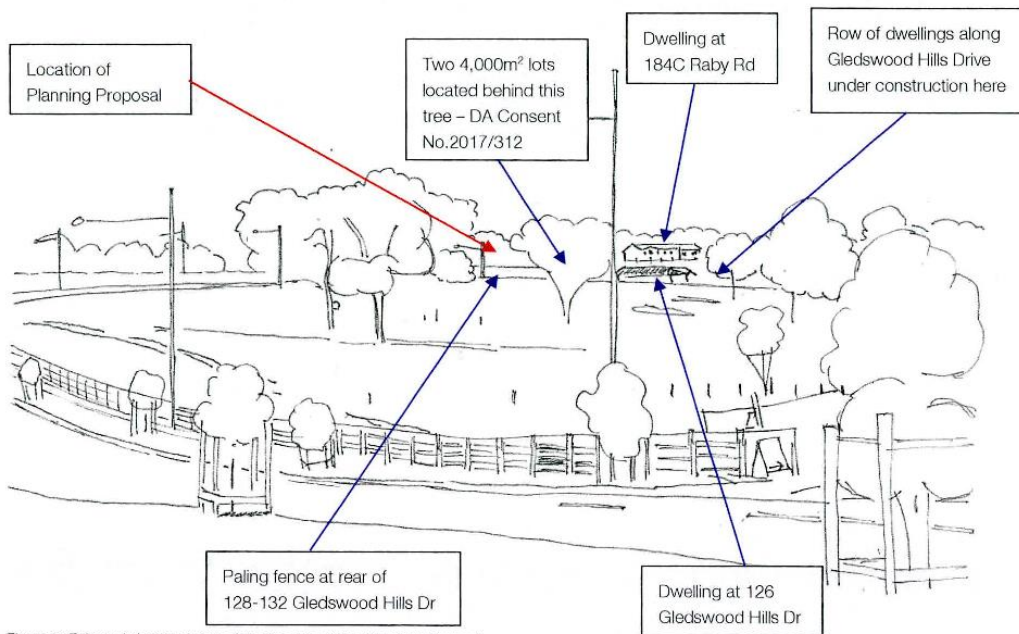


Figure 6: Enlarged sketched view of the location of the Planning Proposal

- 3. Updated justification within the Planning Proposal outlining that the proposal is a logical extension to the urban zone and the proposed lot is separate from the family holding.

Please find attached an updated Planning Proposal dated March 2018.

- 4. Applicant to provide a photo of the shed that previously existed on the site, if possible.

A photograph of the former hayshed structure has not been located, however it is evident from the aerial photograph dated 17 January 2017 at Figure 1 and replicated at Figure 7, that the hayshed structure that stood on the site was of a significant scale.

It is evident from the aerial photograph from 21 January 2018 at Figure 8, the former location of the hayshed and its footprint in comparison to a new dwelling being built to the north at No.126 Gledswood Hills Drive.

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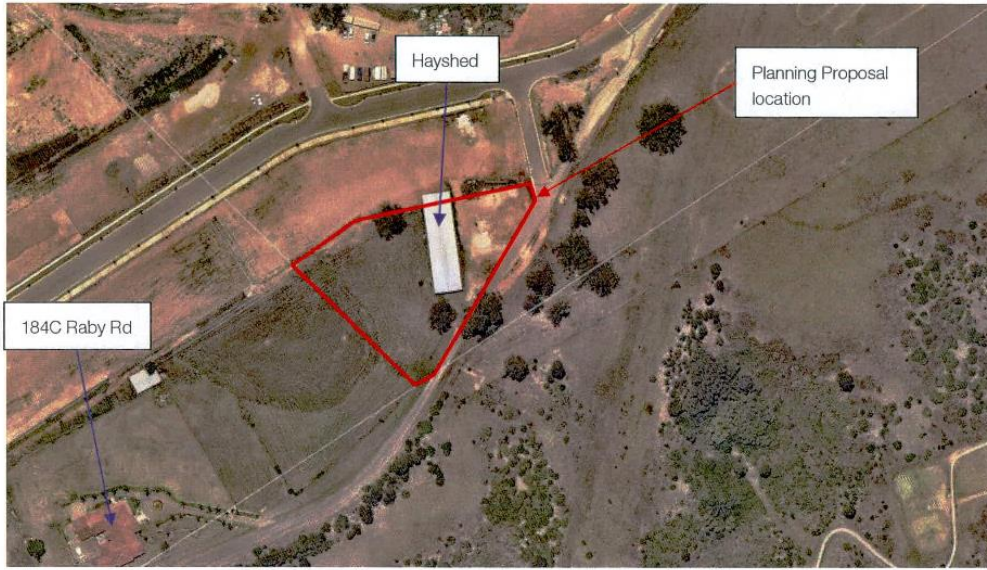


Figure 7: Aerial photograph of 17 Jan 2017 (Source: maps.au.nearmap.com)

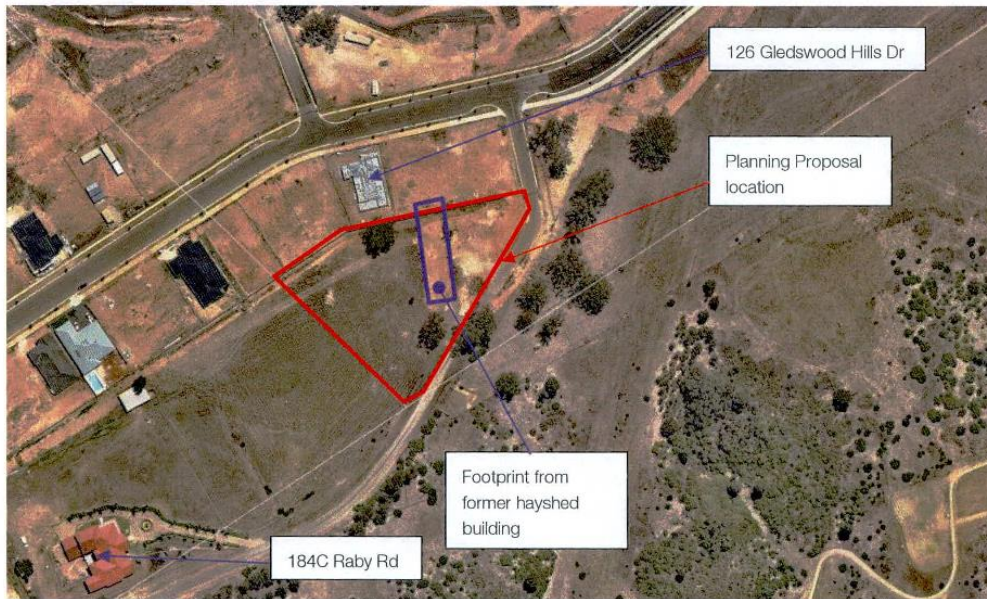


Figure 8: Aerial photograph of 21 Jan 2018 (Source: maps.au.nearmap.com)

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Michael Baker  
SJB Planning  
Level 2, 490 Crown St  
Surry Hills NSW 2010  
Sent via email: [mbaker@sjb.com.au](mailto:mbaker@sjb.com.au)

18SUT-9695

28 February 2018

Dear Michael,

**Ecological assessment to support a planning proposal for 182A Raby Road, Gledswood Hills.**

#### Background

In 2008, a Local Environmental Study (LES) was prepared by APP Corporation to support the rezoning of land known as El Caballo Blanco and Gledswood (ECBG) in Camden LGA. The ECBG study area comprises 207.4 hectares and includes the Gledswood Homestead and Winery property, the former El Caballo Blanco site and three adjoining sites to the east of the Upper Canal (Figure 1).

A number of specialist studies were prepared by Eco Logical Australia (ELA) to support the planning proposal including an Ecological Assessment (2008) and Vegetation Management Plan (2011) which recommended the conservation and restoration of key vegetation and riparian corridors. ELA also calculated offsets required as part of the rezoning (ELA 2010).

The ECBG site was rezoned by amending the Camden LEP 2010 from RU2 Rural Landscape to a number of different zonings including RE2 Private Recreation, SP3 Tourist, R1 General Residential, R2 Low Density Residential and R5 Large Lot Residential.

One of the lots within the ECBG study area that was subject to the rezoning is 182A Raby Road (Lot 102 DP1193881), shown in Figure 1 as the 'study area'. **Figure 2** and **Figure 3** shows that the majority of this lot retained the RU2 Rural Landscape zoning, apart from 2322 m<sup>2</sup> of the southern end, which was rezoned to R5 Large Lot Residential. A right of carriage (ROC) effectively separates the southern end of the lot as shown in **Figure 3**. Under the Camden LEP 2010, the minimum lot size for the R5 zoning is 4.000 m<sup>2</sup>, which effectively renders this area zoned R5 too small for a dwelling entitlement.

#### Proposed rezoning

A planning proposal is being prepared by SJB to support the rezoning of this southern end, as shown in Figure 4. This rezoning will effectively shift the boundary of the R5 zone to the east, to create a lot of 5,119 m<sup>2</sup>. This would enable the creation of a new lot with a dwelling entitlement.

This report provides ecological information to support the planning proposal. "Subject site" refers to the land shown in Figure 4 proposed to be zoned R5.

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### Methodology

Previous studies of the site were reviewed to provide background information regarding the ecological values of the site. This included the Local Environmental Study (APP 2008), Planning Proposal (Camden Council and APP, 2012) previous studies by ELA (2008, 2010, 2011 and 2015) and a tree plan based on the VMP (Brown Consulting 2014).

A site inspection was conducted on 13<sup>th</sup> June 2017 by ELA ecologist Karen Spicer, accompanied by site Project Manager Keith Apps. The vegetation and general site condition was noted. The boundaries of the subject site proposed for rezoning was defined onsite by Keith Apps.

### Results

#### *Literature review*

Previous assessment of the site by ELA (2008) mapped the vegetation within 182A Raby Road as exotic with patches of Shale Hills Woodland (condition TX) and classified the Shale Hills Woodland as a moderate ecological constraint. Under the Camden Natural Assets Policy (CNAP), this vegetation was mapped as "Core-Local" and "Support for Core". Based on the CNAP, ELA (2010) calculated the vegetation offsets required for the El Caballo Blanco / Gledswood rezoning. As part of the biodiversity certification process for the ECBG study area, the vegetation adjacent to the subject site was remapped by ELA (2015) as Shale Plains Woodland.

A tree survey by Brown Consulting (2014) prepared for the Mirvac residential development to the immediate north of 182A Raby Rd was reviewed. This plan showed the trees to be retained and removed based on the Vegetation Management Plan (ELA 2011). The trees within 182A Raby Rd were mapped as retained. As such, there will be no loss of native vegetation from the subject site proposed for rezoning and no requirement for recalculation of vegetation offsets under the CNAP.

Fauna species previously recorded by ELA within the ECBG study area include 58 species consisting of birds (37 species), mammals (11 species), amphibians (6 species), reptiles (2 species) and fish (2 species). No threatened fauna species were identified within the site, apart from a possible record of *Mormopterus norfolkensis* (Eastern Freetail-bat) based on an Anabat recording. Five threatened species were previously recorded within the ECBG study area based on records from the Atlas of NSW Wildlife including Grey-headed Flying Fox, Eastern Freetail-bat, Eastern False Pipistrelle, Greater Broad-nosed bat and Cumberland Plain Land Snail. ELA concluded that 18 listed threatened and migratory species may utilize habitat within the ECBG study area.

#### *Site inspection*

The boundaries of the subject site proposed for rezoning is shown in Figure 5 and includes vegetation mapping of the site. The site was previously used as a cattle yard and contained a large hay shed that has been recently removed. As a result, a large portion of the site is hard surface gravel or exposed soil with no vegetation as shown in Figure 5, **Plate 1** and **Plate 2**.

One native tree (*Eucalyptus tereticornis*) is present within the subject site (Figure 5). Another native tree (*Eucalyptus crebra*) sits just outside northern corner of the subject site. These trees are canopy species associated with the Shale Plains Woodland vegetation community, which is a sub-community of Cumberland Plain Woodland (CPW). CPW is listed as a critically endangered ecological community under the NSW *Threatened Species Conservation Act* (TSC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act* (EPBC Act). Under the EPBC Act, only CPW that meets certain condition criteria are protected (based on patch size and percentage cover of native perennial species). As such, these trees are only protected under the TSC Act, as the EPBC Act condition criteria are not met on site.

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The shrub layer was absent and groundcover species were dominated by exotic species including *Bromus catharticus* (Prairie Grass), *Cenchrus clandestinus* (Kikuyu Grass), *Chloris gayana* (Rhodes Grass), *Lepidium africanum*, *Paspalum dilatatum*, *Plantago lanceolata*, *Senecio madagascarensis* (Fireweed) (Class 4 noxious weed), *Setaria parviflora* and *Sida rhombifolia*. A small number of native forbs were present including *Dichondra repens* (Kidney Weed) and *Einadia nutans* (Climbing Saltbush).

Shale Plains Woodland, dominated by *Eucalyptus molucanna* is present throughout 182A Raby Road, including the land to the north and east of the right of carriage. These trees will be maintained and will not be impacted by the proposed rezoning of the southern end of the lot. Shale Plains Woodland towards the north and west of the study site has been cleared to allow for residential development which is currently under construction by Mirvac. The tree survey plan by Brown Consulting (2014) is consistent with this, showing trees north and west of the subject site within the Mirvac residential area as "existing tree to be removed from resident development" and trees within 182A Raby Road as "existing trees to be retained".

Due to the paucity of vegetation within the subject site and a lack of vegetation structure and diversity, fauna habitat is poor. The tree present within the subject site did not contain hollows and fauna habitat would be limited to highly mobile species including birds and bats that are not cover dependent. Habitat for Cumberland Plain Land Snail was absent due to the lack of fallen logs and leaf litter.

#### Conclusion

The ecological values of the subject site are poor, as the site is either cleared or dominated by exotic grasses. One Cumberland Plain Woodland canopy species is present but will be retained within the site following the rezoning. As such, and consistent with the surrounding residential development, the proposed rezoning of the subject site will not impact the ecological values of the subject site.

Yours sincerely,



Karen Spicer

Ecologist

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ECO LOGICAL AUSTRALIA PTY LTD

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References

APP Corporation (2008). El Caballo Blanco & Gledswood Rezoning Local Environmental Study. Prepared by Camden Council.

Brown Consulting (2014). Tree survey over Lots 101 in DP 1193881, Pt3 in DP1193163, Lot 401 in DP1196627 and 501 in DP1196228, Camden Council, Raby Road, Catherine Fields (Drawing No. X14150-TREE-V4).

Camden Council and APP Corporation (2012). El Caballo Blanco & Gledswood Rezoning, Planning Proposal.

Eco Logical Australia (2008). Ecological Assessment, El Caballo Blanco & Gledswood Rezoning.

Eco Logical Australia (2008). Bush Fire Assessment, El Caballo Blanco & Gledswood Rezoning.

Eco Logical Australia (2010). Offsetting calculations for the El Caballo Blanco / Gledswood Rezoning site.

Eco Logical Australia (2011). Vegetation Management Strategy, El Caballo Blanco & Gledswood Rezoning.

Eco Logical Australia (2015). *El Caballo Blanco, Gledswood and Lakeside residential estate: Biocertification Assessment and Strategy*. Prepared for SH Camden Lakeside Pty Ltd, 4 November 2015.

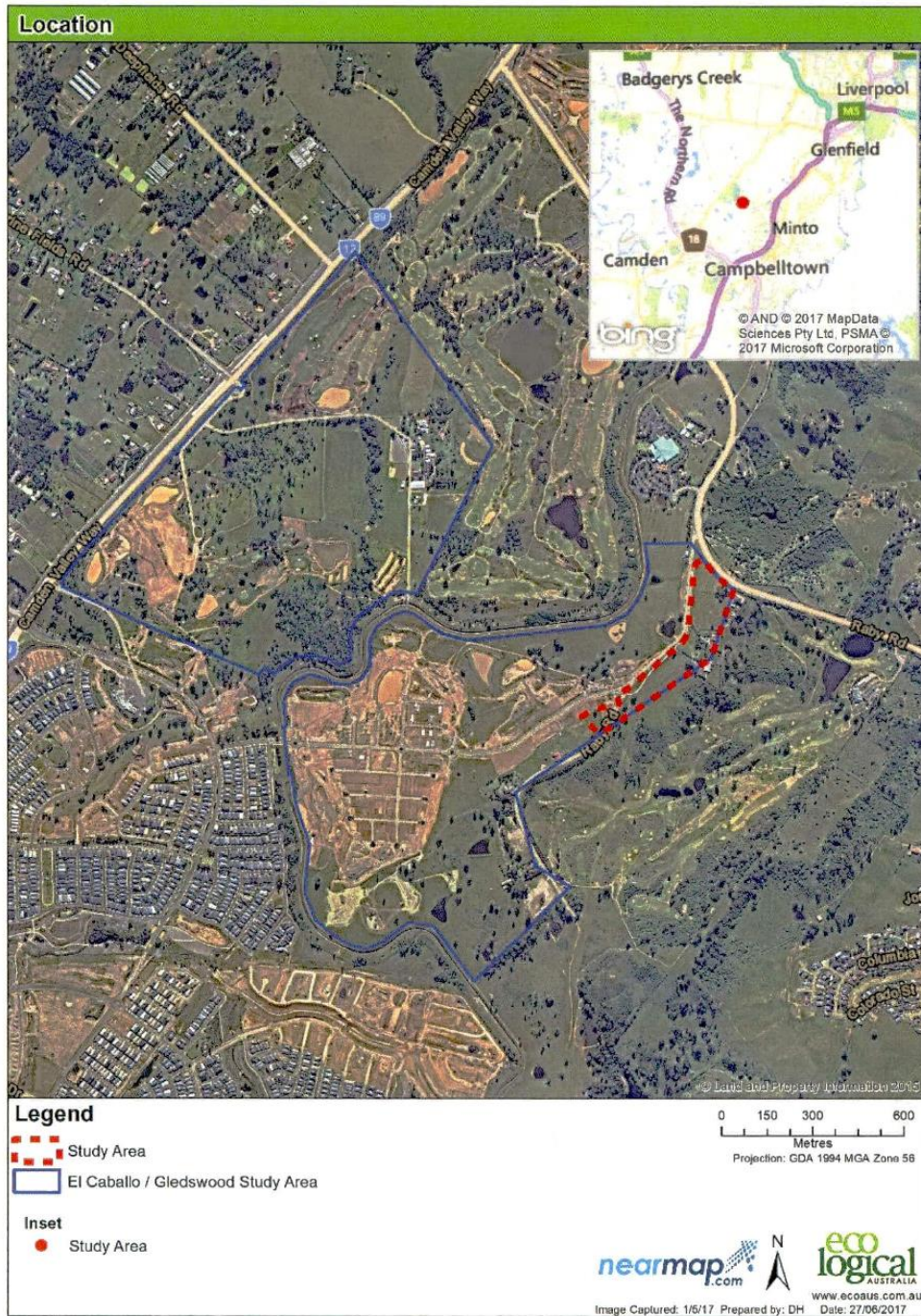


Figure 1: Location map for El Caballo Blanco / Gledswood study area.

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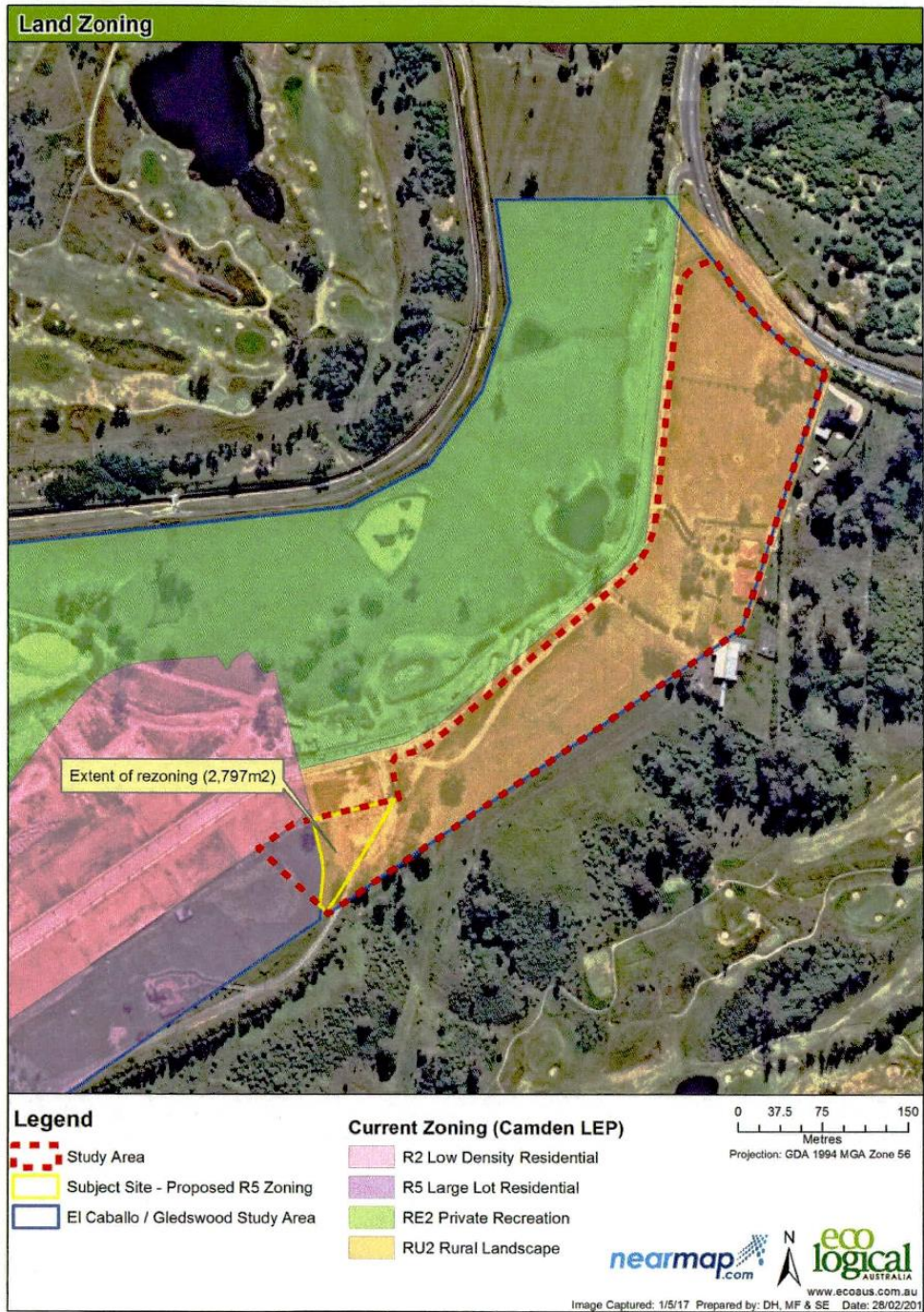


Figure 2: Current zoning of 182A Raby Road.

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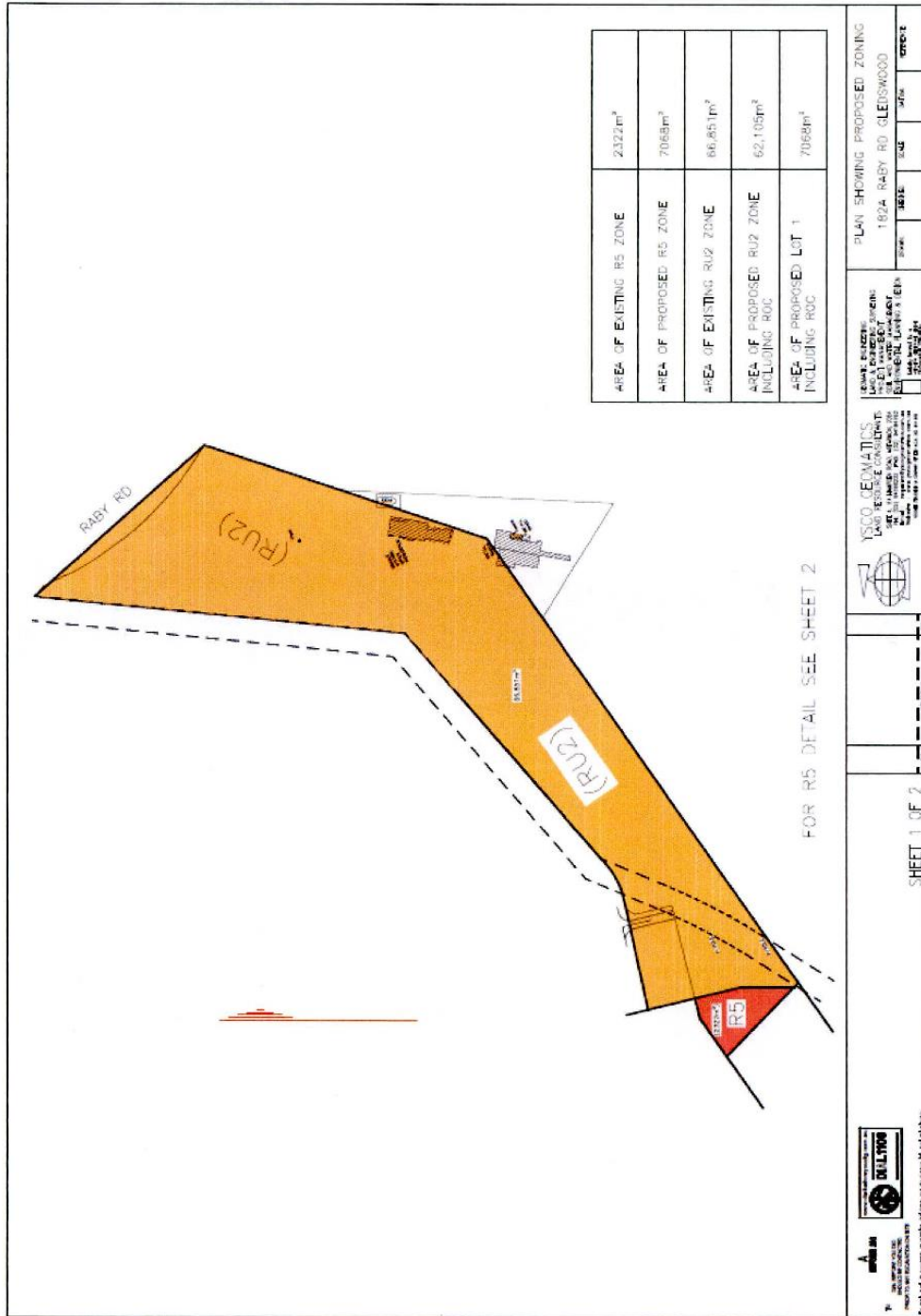


Figure 3: Survey plan showing existing zoning for the study area (182A Raby Road).



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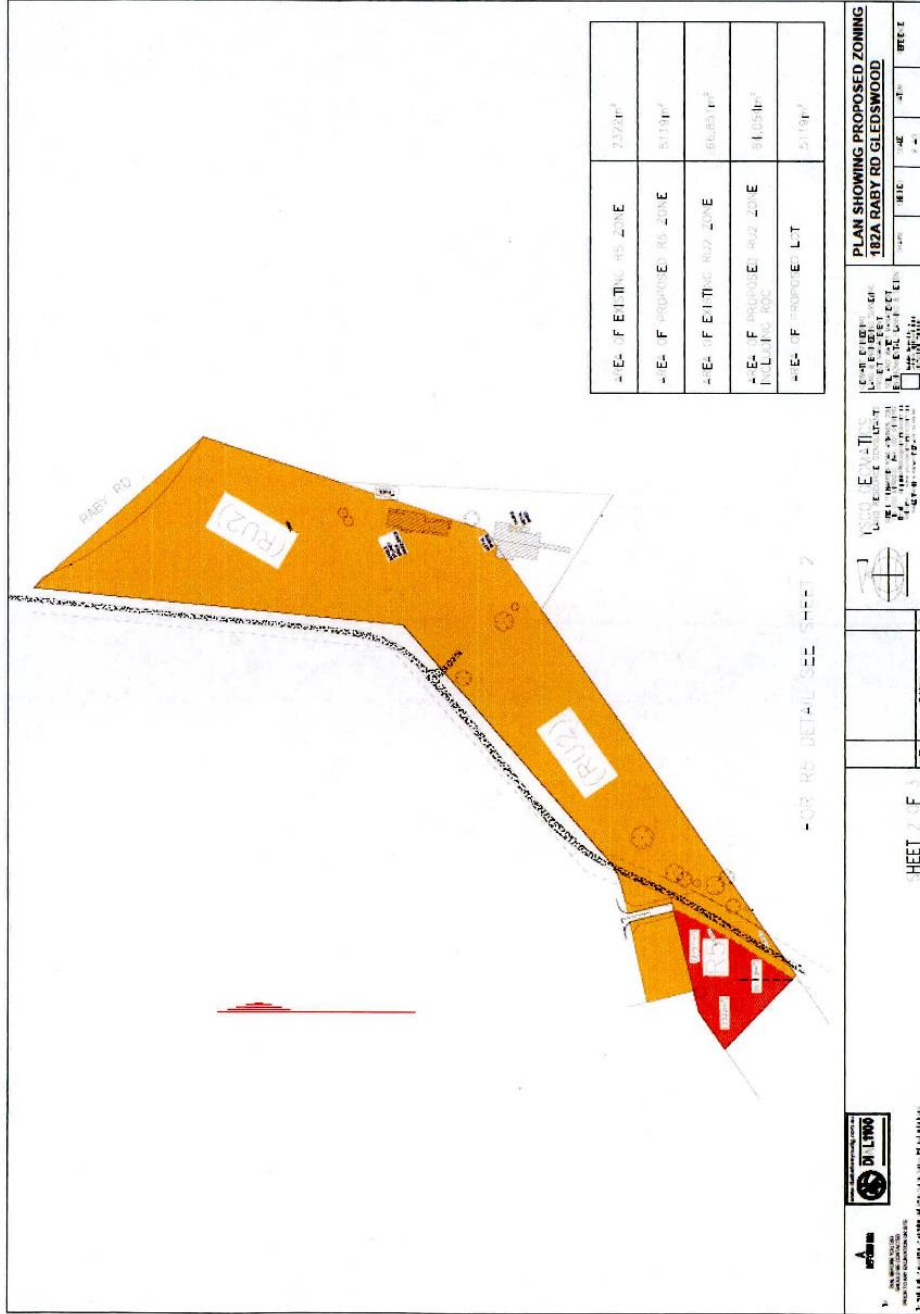


Figure 4: Survey plan showing the proposed zoning for the subject site.



Figure 5: Vegetation map for the subject site.

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Plate 1: Subject site of proposed rezoning – facing north. The majority of the site is cleared.



Plate 2: Subject site facing west towards the Mirvac development. The tree shown (*Eucalyptus crebra*) is just outside the subject site.



**Visual Impact Assessment**  
**Proposed rezoning of land at**  
**182 Raby Road, Gledswood Hills**



*Prepared by*  
**Chris Betteridge, Betteridge Consulting Pty Ltd t/a**  
**MUSEcape**

*for*

**TN Consulting Pty Ltd**  
**on behalf of the owner**

**23 August 2017**

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**SPECIALISTS IN THE IDENTIFICATION, ASSESSMENT, MANAGEMENT AND INTERPRETATION OF CULTURAL HERITAGE**

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**Figure 1 (Front cover)** Panorama from part of the subject property looking towards Raby Road. (Photo: Chris Betteridge, 16 June 2017)

## 1.0 Introduction

### 1.1 Background

A parcel of land at 182 Raby Road, Gledswood Hills (the subject property) is currently zoned RU2 (Rural Landscape) but adjoins lands which have been rezoned to R5 (Rural Residential). The owner of the subject property wishes to convert 7,000m<sup>2</sup> of land zoned RU2 to R5 zone. For the original rezoning of the area, a visual analysis study by LFA (Pacific) Pty Ltd was completed which showed this section of the land as “highly visible” from Raby Road but not from the Scenic Hills.

TN Consulting Pty Ltd, on behalf of the owners of the subject property have engaged Chris Betteridge, Director, Betteridge Consulting Pty Ltd t/a **MUSEcape** to assess the potential visual impact of the proposed rezoning on major viewing points in the public domain and any other heritage or scenic viewing points.

This Visual Impact Assessment (VIA) has been prepared as part of the documentation to accompany a planning proposal for rezoning of the subject property.

### 1.2 Property Location

The location is shown in Figure 2 below.



**Figure 2** Location of the subject property, edged red, with its northern boundary on Raby Road. (Source: *nearmap*, 9 August 2017)

### 1.3 Methodology

Preparation of this report involved a site inspection on 13 June 2017 and consultation with the client's planning and environmental consultants. The report includes a brief physical description of the site, a visual analysis, description of the rezoning proposal, visual impact assessment, conclusion and recommended mitigative measures.

### 1.4 Authorship

This report has been prepared by Chris Betteridge, Director of Betteridge Consulting Pty Ltd trading as **MUSEcape**, specialists in the identification, assessment, management and interpretation of cultural landscapes. The author was Specialist – Environmental / Landscape in the Heritage & Conservation Branch, NSW Department of Planning for ten years. He was consultant Heritage Advisor to both Port Stephens Council and Wollondilly Shire Council for eight years and has been in

private practice as a heritage consultant since 1991. Chris has specialised in the conservation of significant places, including some of the most important cultural landscapes in NSW. He has prepared or contributed to conservation planning documents for many significant sites and in recent years has prepared many heritage impact statements for proposed developments affecting listed items or conservation areas.

### **1.5 Acknowledgments**

The author would like to thank Keith Apps, TN Consulting for his kind assistance in the preparation of this report.

## **2.0 Site description**

### **2.1 The subject property**

The subject property is an irregularly shaped block with a frontage to Raby Road at its northern end. The western boundary mostly adjoins the road which will provide access from Raby Road to the Crest residential subdivision. The southwestern end of the subject property adjoins a rural residential lot. The eastern and south-eastern boundary adjoins rural land which in turn adjoins the golf course.



**Figure 3** View north from the southern end of the subject property, showing part of the sound attenuation barrier along Gledswood Hills Drive at far left. (Photo: Chris Betteridge, 16 June 2017)

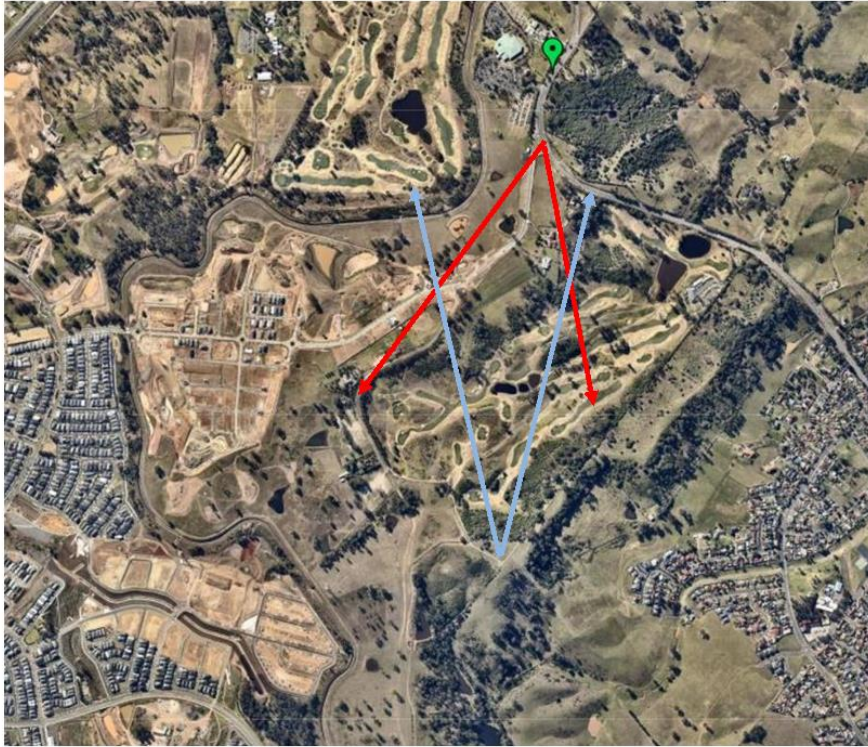
### **2.2 Landscape character and adjoining development**

The bulk of the subject property is cleared grazing land, with scattered remnants of the original plant community, predominantly remnant woodland trees. The character of the adjoining lands is changing rapidly from gently undulating landscape with scattered residences and rural buildings in grazing land to a more urbanised environment of housing subdivisions and the Lakeside Golf Club Camden and The Grange Golf Club courses.

### **2.3 Views and visual absorption capacity**

There are views towards the subject property from the intersection of Raby Road and Gledswood Hills Drive in the vicinity of the Crest Estate sales office but these are

interrupted to varying degrees by intervening vegetation. There are distant partial views towards the subject property from high points southeast of The Grange golf course.



**Figure 4** Arcs of view over the subject property from Raby Road (red) and a high point on the ridge southeast of The Grange golf course (blue). (Source: *nearmap / MUSEcape*)



**Figure 5** View from the eastbound carriageway of Raby Road over the northern part of Gledswood Hills Drive towards the subject property, within the area marked red. (Photo: Chris Betteridge, 13 June 2017)





**Figure 6** View from high point southeast of The Grange golf course towards the subject property, marked red. (Photo: Chris Betteridge, 13 June 2017)

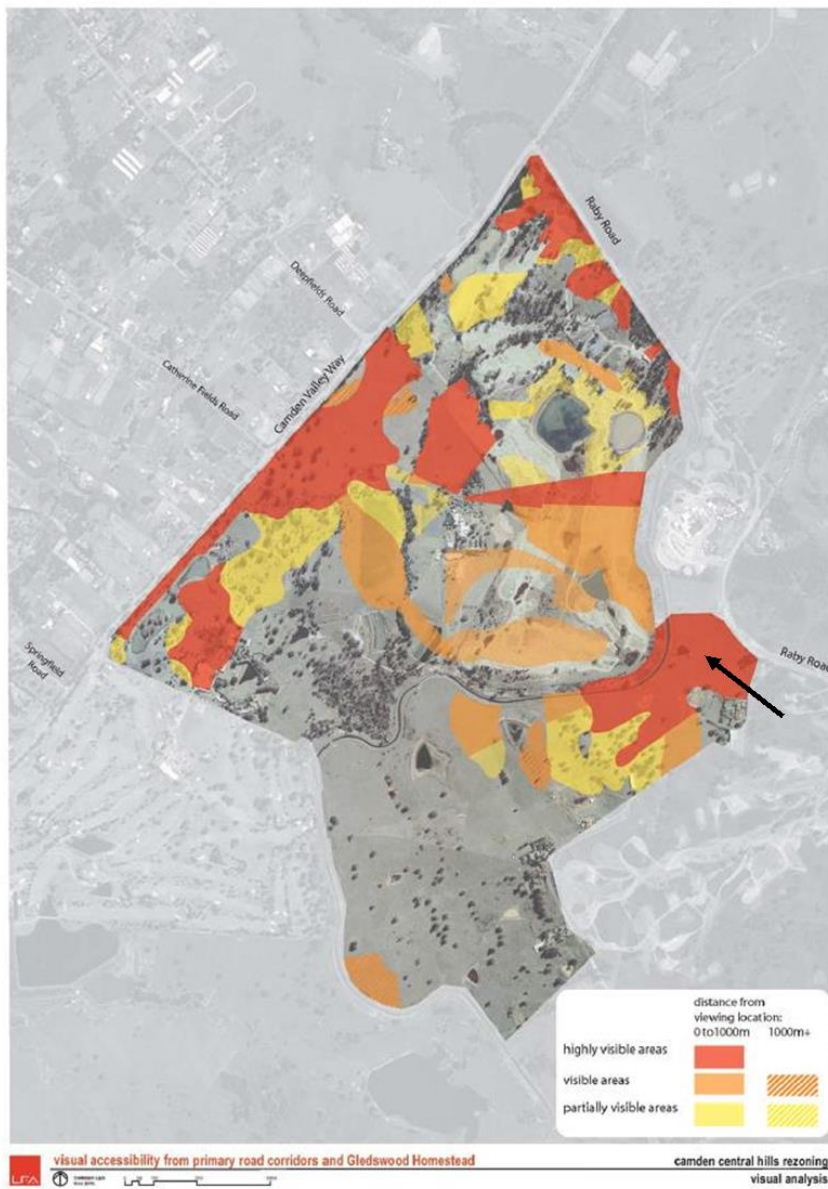
Visual absorption capacity is an estimation of the ability of a particular area of landscape to absorb development without creating a significant change in visual character or a reduction in scenic quality of the area. The capacity of an area to absorb development visually is primarily dependent on landform, vegetation and the location and nature of existing development. Generally, flat or gently undulating open forest or woodland has a higher capacity to visually absorb development than open heathland or swamp or heavily undulating topography with cleared ridges and slopes.

A major factor influencing visual absorption capacity is the level of visual contrast between the proposed development and the existing elements of the landscape in which it is to be located. If, for example, a visually prominent development already exists, then the capacity of that area to visually absorb an additional development of similar scale and form is higher than a similar section of land that has no similar development but has a natural undeveloped visual character.

The subject property is considered to have an increasingly high visual absorption capacity to absorb development of the type and density likely to follow the proposed rezoning without major changes to the way it is perceived from public viewing points, particularly Raby Road. However, adequate setbacks of any new residential development from roadways, combined with careful placement and design of any new houses and appropriate landscaping will reduce negative impacts on the scenic values of the place to an acceptable and manageable level.

### 3.0 Visual Impact Assessment

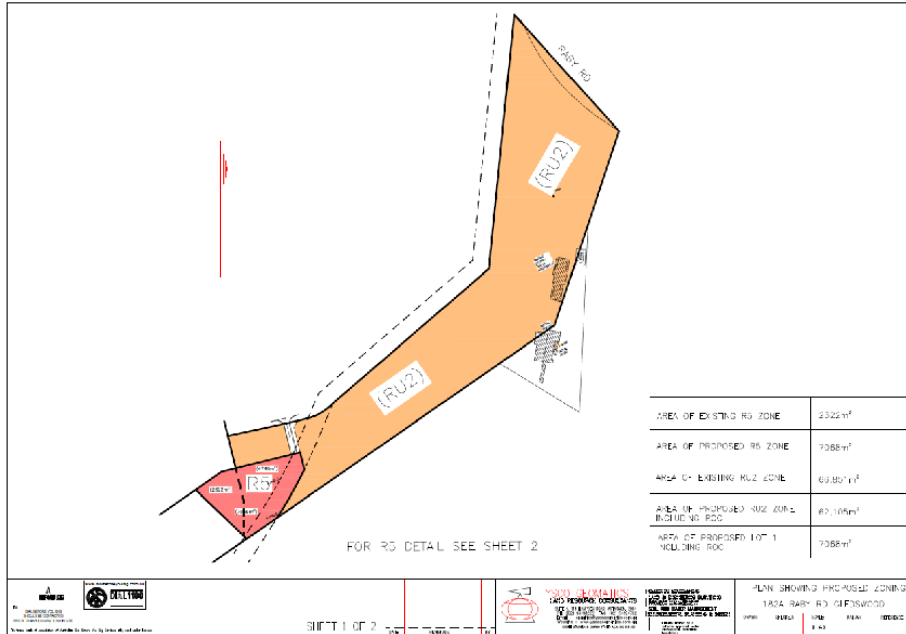
#### 3.1 Previous visual assessment



**Figure 7** Visual accessibility from primary road corridors and Gledswood Homestead, showing the location of the subject property, arrowed black. (Source: LFA (Pacific) Pty Ltd)

### 3.2 The proposal

The proposal is detailed in the diagram below.



**Figure 8** The subject property showing the current zonings and the areas of existing and proposed zonings. (Source: YSCO Geomatics Land Resource Consultants)

### 3.3 Assessment of impact

Rezoning of the subject property, *per se*, will have no visual impact on views from major viewing points in the public domain such as Raby Road or from other scenic viewing points in the nearby area. The type and scale of development likely to follow the proposed rezoning, subject to Council consent, is considered likely to have only minor and manageable impact on views from Raby road and other viewing points in the area.

### 3.4 Mitigative Measures

The following mitigative measures are recommended to reduce any adverse visual impacts likely to arise from implementation of the Planning Proposal.

1. Exterior finishes of any future development on the subject property to meet Council requirements and be chosen from a colour palette to minimise visual impact when viewed from the public domain.
2. Screen planting along the Gledswood Hills Drive boundary of the subject property with plant species to meet the following requirements:
  - Known to be part of the original plant community;
  - Environmentally sustainable;
  - Non-invasive;

- Any exotic ornamentals should be historically appropriate for the cultural landscape of the area.

#### 4.0 Conclusion

The visual absorption capacity of the area is such that the proposed rezoning and any likely subsequent development can be accommodated without unacceptable changes to the perception of the site as viewed from major viewing points in the public domain.

In my opinion, provided the recommended mitigative measures are implemented, the proposal is within the limits of acceptable change for the place and any visual impacts will be minor and manageable.

In my opinion there are no visual quality grounds for refusal of the application.



Chris Betteridge  
Director, Betteridge Consulting Pty Ltd t/a **MUSEcape**  
Heritage Consultants

Date: 23 August 2017

CENTRAL HILLS REZONING

CAMDEN COUNCIL

LANDSCAPE AND VISUAL ASSESSMENT

Prepared by  
LFA (Pacific) Pty Limited  
November 2005

DRAFT REPORT



LFA (Pacific) Pty Ltd

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## 1 INTRODUCTION

LFA (Pacific) was invited by Camden Council to undertake a landscape and visual assessment of part of the Central Hills area. The study area is defined to the west by Camden Valley Way and to the north by Raby Road and extends 2 km southward from Raby Road to abut the Camden Valley Golf Resort to the southwest and the Macarthur Grange Golf Course to the southeast. The total study area covers 321 ha.

This report includes a detailed analysis of the study area, sets out the visual assessment methodology and identifies the potential zones that could be developed for urban and tourism purposes without impacting on the prevailing rural qualities of the study area.

## 2 CONTEXT

The Central Hills lands identified within the Camden structure plan are significant in terms of maintaining the integrity of the Central Hills lands as an important scenic and rural buffer between the urban areas within the Camden and Campbelltown local government areas.

The essential character of the Central Hills is seen to be generally open landscape, such that any urban form components are to be subservient. The conservation and heritage qualities, including cultural landscapes as well as maintenance of biodiversity and vegetation corridors, are also regarded as integral elements of the Central Hills area.

Within the study area there are a number of existing land uses and activities including –

- Camden Lakeside Golf and Country Club
- Gledswood heritage buildings and supporting complex
- Gledswood Ponds which have been used for water treatment purposes
- The defunct El Caballo complex [tourist attraction]
- A water supply canal
- Rural residential lands

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### **Camden Lakeside Golf and Country Club**

Established in 1993 and opened as an 18-hole golf course in the same year. It is a high quality facility and is considered amongst Sydney's premier golf courses. The existing facilities within the complex include –

- 18-hole golf course
- clubhouse and conference facility
- fully equipped pro-shop

The 2<sup>nd</sup> stage of the staged development consent provides for -

- 22 villas containing
- 2 executive residences containing
- company lodge
- hotel/motel rooms (42)

### **Gledswood Heritage Buildings and supporting complex**

An historically significant convict-built sandstone home set on 64 hectares of gently undulating rural lands. The homestead was originally built (C.1810) and owned by the Chilholms, an early pioneering family. The colonial homestead consists of two wings, one running north-south and the other east-west. An extensive lawn and garden extend out from the homestead with sweeping views across nearby lands and Rileys Creek.

Gledswood Homestead and Winery now operates as a tourism and entertainment facility including –

- a restaurant
- areas for corporate functions, weddings and parties
- educational excursions
- historic tours



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### **Gledswood Ponds**

Gledswood Ponds is located immediately south of the Gledswood Homestead property. The Ponds have operated as an effluent disposal site, regularly receiving waste by truck. Access to the Ponds is via an unsealed track that joins with the access road to Gledswood Homestead.

The future use of the site has been under review by Council.

### **El Cabello Blanco site**

The remnants of the defunct El Cabello Blanco facility is located in the southwest corner of the study area adjacent Camden Valley Way. Otherwise known as "Australiana Park", the facility included showrings, stables, exhibition rooms, picnic areas and associated amenities.

Many of the facilities remain in a dilapidated state on both the hillside and ridgeline facing Camden Valley Way. Access to the site is via a road connection to Camden Valley Way, opposite Catherine Fields Road.

### **Water Supply Canal**

The Water Supply Canal is a formed channel traversing the study area in a north-south direction.

The canal crosses under Raby Road adjacent to the northeast corner of the study area and flanks the boundary of Camden Lakeside, Gledswood, Gledswood Ponds and Camden Valley Golf Resort. In the southern part of the study area, the canal is adjacent to rural lands.

The canal is primarily open apart from a short tunnel located adjacent to Camden Valley Golf Resort.

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The canal and associated easement is maintained by Sydney Water. Public access to the canal and easement is not permitted.

### **3 RURAL RESIDENTIAL LANDS**

Rural residential lands east of the canal are rural grazing lands with a small number of associated residences up to two storeys in height. The properties are accessed via a private road from Raby Road

### **4 STUDY PURPOSE**

The study aim is to critically evaluate the study area and identify the visual qualities and the character of the study area with the broad objective of defining those areas that could be developed for residential, tourism and related purposes without impacting on the prevailing rural qualities of the scenic hills area.

### **5 PLANNING FRAMEWORK**

The study area lies within the Camden Shire Council Local Government Area (LGA). The area is currently zoned 7(d) Environment Protection (scenic) under the Local Environmental Plan No. 48 1992.

The objectives of this zone are:

- To protect and enhance those areas of particular scenic value and ensure that the land remains a rural environment providing visual contrast to urban development
- To maintain the visual amenity of prominent ridgelines
- To enable cluster housing and recreation and tourist orientated uses to be carried out if they are in keeping with the environmentally sensitive nature of the zone.
- To prevent development in geologically hazardous areas and escarpment areas.

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The draft Camden Scenic and Cultural landscape study prepared by Camden Council identifies the visual catchments of the scenic hills area. The study identifies the study area as the Raby/Gledswood area. Characteristics are predominantly broad-acre grazing with a pocket of re-growth woodland in the northeastern sector adjacent to Camden Valley Way. An area of large scale rural residential is identified in the eastern sector accessed from Raby Road.

## **6 METHODOLOGY**

The initial assessment process involved a review of Council's strategic studies, in particular the Camden Scenic and Culture Landscape Study, to identify key thematic elements within the study area.

The study intent was also to review the RTA Camden Valley Way Urban Design Study to ensure that there was an understanding of the potential visual impacts associated with the proposed upgrading of Camden Valley Way. The objective was to gauge the likely effect of the proposed road design on existing views as well as the potential visual impact of any noise attenuation measures.

During the course of the study, it has become evident that the RTA Camden Valley Way document will not be made available and accordingly it has proved difficult to gauge the potential impacts of any upgrading roadworks. From the limited amount of information that has become available, it is understood that the general intent is to provide for a dual road system with two lanes in each direction. It is understood, but not certain, that the proposed new road will generally be located to the west of the existing Camden Valley Way and be separated from the existing road system by the existing vegetation.

From a visual and landscape point of view, LFA would recommend that the separation of the proposed upgrading roadworks from the existing Camden Valley Way be pursued together with the retention of the existing substantial vegetation that exists to varying degrees along the length of Camden Valley Way within the study area.

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The detailed field datasheets, together with supporting site photographs, are set out in the Appendix.

Each viewing location is identified, together with a description of the existing visual and landscape qualities. An assessment of the potential visual impact of any new development is also defined.

## **7 SITE ANALYSIS**

### **Significant remnant vegetation**

The study area contains some significant remnant Cumberland Plain vegetation, albeit in relatively small quantities. The more intact vegetation communities are located in the upper reaches of Rileys Creek, along the banks of Rileys Creek and in the northern and north-eastern portions of the study area. Also scattered across the golf course, grazing lands and former El Cabello Blanco site are mature remnant trees, grass areas and regrowth.

In the northern corner of the study area, golf course lands have been categorized as 'linkages and corridor communities' by NSW National Parks and Wildlife Service (NPWS). Although the lands have been predominantly cleared of vegetation, some significant remnant vegetation has been identified, including a relatively small area of core support habitat for Cumberland Plain Woodland.

The core support habitat is a riparian vegetation community located adjacent the property boundary near the intersection point of Rileys Creek and Camden Valley Way. The vegetation is mostly comprised of *Casuarina* sp. and semi-aquatic species. The expansion of the community appears limited by Camden Valley Way and the adjacent irrigation lake.

A relatively small area of *Pimelea spicata* has also been identified within the Camden Lakeside property. The species is classified as 'threatened' by NPWS and is subject to protective legislation.

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The remnant vegetation, in combination with planting mostly along the property boundaries, help in establishing a natural, bushy character within the study area.

#### **Landform, slope and drainage**

The landform within the study area is characterized by rolling hills, ridgelines and gently sloping plains.

Generally the natural landform has not been modified, except within areas of the golf course, probably in the area around Gledswood Homestead and on lands occupied and adjacent the irrigation dams.

For the most part, the study area is comprised of gentle to moderate slopes, ranging mostly from around 1 in 20 to 1 in 50, with some limited areas of ground steeper than 1 in 10. Almost no land areas are steeper than 1 in 5.

The flattest land is located within the south-eastern part of the golf course, in the central areas of the grazing lands east of the water supply canal and along the ridgelines. The lands within the water supply canal easement are generally also relatively flat. Overland drainage flows are directed away from the canal.

The steeper slopes within the study area are primarily located on the lands falling away from the dominant ridgelines located on the El Cabello Blanco site and adjacent the boundary with Macarthur Grange Golf Course. Some of the lands falling away from Camden Valley Way, especially around the boundary of Camden Lakeside and Gledswood properties, are moderately steep from 1 in 10 to 1:20.

The primary drainage line through the west of the study area is Rileys Creek. The upper reaches of the creek are located amongst remnant vegetation immediately south of Gledswood Ponds. The creek flows toward the north, transecting the Gledswood property and flowing on to the golf course lands where it passes through a series of small wetlands and lakes.

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Other minor drainage lines are located across the study area, generally terminating at small dams intended for irrigation use. There appear to be no signs of erosion on any lands within the study area.

### **Infrastructure and roads**

Included within the study area are regional power, gas and water infrastructure services. The eastern half of Camden Lakeside golf course and the lands east of the water supply canal contain 330kV and 132kV overhead power lines, oriented in a north-south direction, with associated easements. Close to Raby Road are an underground gas mains and a 20 metre easement.

The water supply canal is responsible for movement of fresh water to areas south of the study area. Flows along the canal are toward the south. Sydney Water maintains an easement associated with the canal.

Vehicular access into the subject land is available from two points along Raby Road and one location along Camden Valley Way. On Raby Road, a road provides access to the Camden Lakeside golf club and another road, located within a 20 metre easement, services rural-residential properties in the east of the study lands. Access to the former El Cabello Blanco site, Gledswood Homestead and Gledswood Ponds is provided via a road serviced from Camden Valley Way, near Catherine Fields Road.

## **8 CONCLUSION**

The analysis process indicated that there were substantial areas that potentially could be developed within the study area without impacting adversely on the scenic qualities. Two categories of potential development zones were identified based on a 'sieve' process including –

- Areas where development could occur without any form of screening, given topographic and other constraints that inhibited visual access to the identified areas from Camden Valley Way, Raby Road and Gledswood

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- Potential areas that could be developed subject to landscape screening measures. In general, such areas would draw upon existing landscape which would need to be supplemented to provide an appropriate screen

The principal areas of potential development included areas within Camden Lakeside where screening was generally achieved by both topographic form and existing landscape. There were also substantial areas located within the eastern sector of El Caballo Blanco lands and areas south of Gledswood. Substantial areas were also identified in the southern sector of the study area, currently occupied by rural land use.

Although the potential development areas identified above were significant, the next step was to overlay the various golf course commitments, both existing and proposed, given that the footprint of the golf courses will effectively limit the residual development capacity of the potential areas for urban development.

The next step in the 'sieve' process was to overlay the existing Camden Lakeside Golf Course and then the proposed Medallist Golf Course. The latter occupies sectors of El Caballo Blanco lands, the Gledswood Ponds area and part of the rural residential lands located to the south of the water supply canal.

A further constraint was also identified stemming from the defined riparian corridors associated with the creek systems within the study area. Rileys Creek was defined as Category 1 with the remaining creeks categorized as Category 2. This also had the effect of further limiting the capacity of the potential development zones.

It became evident that overlaying the riparian zones on both the Camden Lakeside and proposed Medallist course had significant impacts. In the case of the Camden Lakeside course, it is understood that the riparian zones will not impact on the existing golf course layout but could impact on lands otherwise considered to have development potential.

In terms of the proposed Medallist Golf Course, it is evident that, should there be a requirement that the golf course layout not traverse the defined riparian corridors, there

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will be a need to modify the proposed layout of the Medallist Golf Course which, in turn, could impact on the development potential of the southern lands within the study area.

A further consideration that needs to be taken into account, once the residual development zones have been identified, is an appreciation of the topographic structure and creek patterns and the effect they will have on development potential. To maintain the visual qualities of the area, it will be necessary to provide landscape buffers along prominent ridge lines thus inhibiting further development crossing the skyline.

A further constraint that also needs to be taken into account is the series of easements that traverse the area. These easements include a number of high voltage and low voltage electricity transmission lines together with gas pipelines.

The final drawing – Potential Development Pattern – indicates the identified pockets of potential development areas that are compatible with the existing and proposed golf courses, together with the constraints imposed by the major infrastructure elements that traverse the site, as well as taking into account ridgelines and drainage lines.

82 ha of land has been identified to have development potential that would not impact on the scenic and visual qualities of the 351 ha study area.

It is acknowledged that the potential development patterns so identified will still need to be informed by a series of parallel studies which may place further limitations on the development potential. Such studies include –

- Acoustic
- Ecological
- Heritage
- Golf course layout
- RTA Camden Valley Way
- Geotech/Contamination



CENTRAL HILLS REZONING  
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DRAFT APPENDIX



**FIELD DATA SHEETS****Viewing Location** 5**Location description** Camden Valley Way at intersection with Deepfields Road.**View direction** North along Camden Valley Way and south toward study area.**Existing visual and landscape qualities** Clear views are limited to the relatively small open grass area immediately adjacent Camden Valley Way. The area is located within the Gledswood property. More expansive views of the hillside west of Rileys Creek and beyond are impeded by the roadside embankment commencing adjacent the intersection and running south along Camden Valley Way.

Views from Camden Lakeside are blocked by nature remnant vegetation and regrowth located within the roadside verge and western corner of the Camden Lakeside property. No existing built form within the study area is visible from the viewing location

**Likely visual impact of new development and recommendations** New Development on the cleared area within Gledswood lands would be highly visible from the viewing location. Earth mounding or vegetation screening would have limited success in obscuring development in this area and would diminish the experience of visual interaction with the rural environment and hilltop. Development would detract from the rural character and is not recommended in the cleared area.

The visual impact of new development within other parts of the study area is likely to be low or non-existent. With some accompanying vegetation screening, development within Camden Lakeside would have almost no visual impact from the viewing location. Other development, including around Gledswood Homestead, east of the water canal and on the former El Caballo Blanco site, would not be visible from viewing location 5 and therefore would have no visual impact

ORD01

Attachment 7

VIEWING LOCATION 5



**FIELD DATA SHEETS****Viewing Location** 6**Location Description** Camden Valley Way, approximately 100m north of intersection with Catherine Fields Road.**View Direction** South east toward the study area**Existing Visual and Landscape Qualities** Clear panoramic views of large parts of the study area are available from this viewing location. The viewcone sweeps from the north east around to the south east.

In the foreground area (west of Rileys Creek) are highly visible grazing lands within the Gledswood property. The cleared grass hillside and dam combine to create a distinctly rural landscape character.

Beyond Rileys Creek partial views of Gledswood Homestead and gardens are available, allowing a significant visual connection between the grazing lands and the Homestead.

Toward the north east, parts of Camden Lakeside are visible, including the clubhouse which is almost 1km from the viewing location.

Toward the south east views extend past the driveway to Gledswood, up to Gledswood ponds. However, this aspect is secondary to the main views of the immediate grazing lands and Gledswood Homestead.

**Likely visual impact of New development and recommendations**

The vista available from the viewing location has been identified in Camden Council's *Camden Scenic and Cultural Landscapes Study* as 'significant'. The existing conditions allow one of the best views of the study area from Camden Valley Way.

The expansive views of the hillside, Rileys Creek, Gledswood and Camden Lakeside golf course, including the clubhouse, provide an excellent snapshot of the various land uses and natural features, such as topography, drainage and vegetation, within the study area.

Any new development in the areas north of the access road to Gledswood Homestead between Rileys Creek and Camden Valley way, in the visible areas adjacent the Homestead and in visible areas of the golf course would detract from the viewing experience. Therefore, it is not recommended that these areas be subject to any new development. Should there be any development in other areas then it should be ensured that it screened adequately so as to not be visible from the viewing location.

Finally, it is also recommended that the existing viewing conditions be maintained in the future to retain this significant vista.

ORD01

Attachment 7

VIEWING LOCATION 6



<b>Viewing Location</b>	<b>7</b>
<b>Location Description:</b>	Camden Valley Way at intersection with Catherine Fields Road
<b>View Direction:</b>	South East Toward the study area
<b>Existing Visual and Landscape Qualities:</b>	<p>The views available from this viewing location are similar to location 6.</p> <p>In the foreground area adjacent Camden Valley the Gledswood grazing lands and drain are clearly visible.</p> <p>Although the homestead is obscured by remnant trees parts of its formal gardens and expansive northern lawn are clearly visible.</p> <p>Views north east to Camden Lakeside golf course are almost entirely blocked by riparian vegetation lining Rileys Creek.</p> <p>In the immediate vicinity of the viewing location is the public entry road to Gledswood Homestead and the former El Caballo Blanco site. The road level and woodland immediately behind impede views further into the study area.</p>
<b>Likely Visual Impact of New Development and Recommendations:</b>	<p>Any new development sited on visible areas within the Gledswood property would have a significant impact on the existing landscape character of Gledswood. Development would also be likely to block the existing visual link to Gledswood Homestead's formal gardens. New development is not recommended.</p> <p>In ending there is appropriate placement of screen planting it may be possible to locate development in the wooded lands east of the public entry road and south of the entry drive to Gledswood without the development being visible from the viewing location.</p>

VIEWING LOCATION 7



<b>Viewing Location</b>	8
<b>Location Description:</b>	Camden Valley approximately 200m south of intersection with Catherine Fields Road
<b>View Direction:</b>	South east toward study area
<b>Existing Visual and Landscape Qualities:</b>	<p>Clear views are limited from this viewing location by scattered remnant and planted vegetation, changes in landform and two chain wire fences in the foreground.</p> <p>The flat grassed area located between Camden Valley Way and the entry road to the former El Caballo Blanco site is highly visible.</p> <p>Beyond this clearing, Eucalypt and Melaleuca tree planting mostly obscure views of the hillside and existing development located along the ridgeline.</p> <p>The area immediately east of the entry road is barely visible or not visible due to a depression in the landform.</p>
<b>Likely visual Impact of New Development and Recommendations:</b>	<p>Any new development sited between the access road and Camden Valley Way would be highly visible from the viewing location and therefore, not recommended. East of the access road it would be possible to enhance existing planting, ensuring retention of nature significant remnant trees, and successfully screen new development from view.</p>



ORD01

Attachment 7



<b>Viewing Location</b>	9
<b>Location Description:</b>	Camden Valley Way approximately midway between Catherine Fields Road and Springfield Road.
<b>View Direction:</b>	South east toward former El Caballo Blanco development
<b>Existing Visual and Landscape Qualities:</b>	<p>A sweeping view of the hillside and ridgeline is available from the viewing location. Beyond the grass embankment immediately adjacent Camden Valley Way is the predominantly cleared and highly visible hillside adjoining the ridgetop development formerly known as El Caballo Blanco.</p> <p>The ridgetop is comprised of a collection of dilapidated showings, riding tracks, recreation areas, exhibition and facilities buildings. The view of the development is partially obscured by screen planting adjacent Camden Valley Way, a limited number of nature remnant trees and exotic planting along the ridge.</p> <p>The development appears to be in a state of semi-ruin and does not exemplify an Australian rural vernacular in its current architectural form.</p> <p>Scattered across the hillside are picnic shelters with tables and seating, and an amenities block. Most of the shelters front the lake, which is not visible from Camden Valley Way.</p>
<b>Likely visual impact of new development and recommendations:</b>	<p>The former El Caballo Blanco site provides an excellent opportunity to remediate and improve existing land uses, whilst conserving existing remnant vegetation and open space.</p> <p>A redevelopment approach that results in a no-net-increase in built form in visible areas and an enhancement of indigenous vegetation would provide a desirable outcome.</p> <p>This approach would permit appropriate redevelopment in locations currently built on and additional development in locations not visible from Camden Valley Way.</p> <p>Removal of existing palm trees and other insignificant exotic vegetation and planting of indigenous vegetation is recommended to further remediate the site and enhance the natural character of the locality.</p> <p>Retention or removal of the lake would be inconsequential to the landscape experience as it is not visible from Camden Valley Way.</p> <p>Finally, it is recommended that the chain wire fence fronting Camden Valley Way be removed and if necessary replaced by a fence of more appropriate rural character.</p>

**ORD01**

**Attachment 7**

**VIEWING LOCATION 9**



<b>Viewing Location</b>	10
<b>Location Description:</b>	Camden Valley Way at the intersection of the entry road to Camden Valley Golf Resort (approximately 150m north of Springfield Road)
<b>View Direction:</b>	North along Camden Valley Way, east toward the study area and south east along the entry road to Camden Valley Golf Resort.
<b>Existing Visual and Landscape Qualities:</b>	<p>Limited views of the study area are available from the viewing location due to dense screen planting along the property boundary of the former El Caballo Blanco site.</p> <p>Some clear views are possible of the roadside area adjacent Camden Valley Way and small sections of development along the ridgeline and the adjacent hillside.</p> <p>A number of mature remnant Eucalypt trees are visible along the property boundaries and ridge.</p>
<b>Likely visual impact of new development and recommendations:</b>	<p>Existing views beyond the boundary vegetation and into the study area are mostly fragmented and limited. With minimal additional screen planting, new development could most likely be absorbed without significant visual impact or diminishment of the existing natural landscape character.</p> <p>It would be desirable for new screen planting to be comprised of indigenous vegetation consistent with existing remnant species.</p>

VIEWING LOCATION 10



**Viewing Landscape** 11

**Location Description:** Camden Valley Way 50m south of Cobbity Road

**View Direction:** North east toward study area.

**Existing visual and landscape qualities:** The viewshed takes in rural grazing lands immediately south of the Camden Valley Golf Resort, including the banks of the large drain a few hundred metres east of Camden Valley Way, remnant vegetation located on the golf course and some distant views of southern lands within the study area.

Large 320kv powerlines traverse the grazing lands in an east-west direction, interacting with the north-south oriented 320kv line transecting the study area.

The viewing location affords a sweeping and comprehensive view of the rural plains and slopes beyond the study area and limited views of the grazing lands in the far south of the study area adjacent the water supply canal.

**Likely visual impact of new development and recommendations**

New development within the vast majority of the study lands would not be visible from the viewing location and therefore, would result in no visual impact.

However, new development on some lands within the southern part of the subject area would most likely be visible, albeit from a long distance away. It is recommended that any development is sited in areas not visible or only partially visible from the viewing location and that appropriate vegetation screening is implemented where necessary to obscure views of new development.

VIEWING LOCATION 11





**VISUAL ANALYSIS  
FIELD DATA SHEETS**

<b>Viewing Location</b>	12
<b>Location Description:</b>	Raby Road approximately 300m south east of intersection with Camden Valley Way
<b>View Direction:</b>	South toward Camden Lakeside Golf Club
<b>Existing visual and landscape qualities:</b>	<p>The viewing location affords clear views of golf holes number two and three, associated 'rough' grass areas between fairways, and Cumberland Woodland vegetation.</p> <p>Due to their open nature, the golf play areas (including fairways, greens and tees) are highly visible from the viewing location.</p> <p>The combination of semi-mature and mature remnant vegetation, as well as recent boundary screen planting, obscure views of the highly wooded ridgeline east of the second fairway and other lands further south. Neither the golf clubhouse nor the Gledswood property is visible from the viewing location.</p>
<b>Likely visual impact of new development and recommendations</b>	<p>Siting of new development in existing highly visible golf play areas would result in a significant alteration to the existing landscape character, as experienced from the viewing location.</p> <p>On partially visible land, such as the ridgeline referred to above, new development would be less likely to have an adverse visual impact and would allow the existing land use, with its generous open space provisions, to continue without interruption.</p> <p>Providing existing vegetation screening was maintained, new development on partially and non-visible areas would not significantly detract from the existing landscape experience nor be incompatible with the existing land use. However, some additional screening where necessary is recommended.</p>

VIEWING LOCATION 12



**Viewing Landscape** 13

**Location Description:** Raby Road at the intersection with the private access road to Camden Lakeside clubhouse.

**View Direction:** South west toward golf course

**Existing visual and landscape qualities:** The view available from this viewing location is dominated by the two-lane access road to the Camden Lakeside clubhouse and carpark. In the foreground semi-mature tree plantings and a low grass understorey flank the road.

Beyond this planting is a gently sloping predominantly cleared hillside, covered by native grasses.

On the upper slopes of the hillside and along the ridgeline, mature remnant trees are visible.

No built form or golf play areas are visible from the viewing location.

Aside from the road, the landscape has a natural, relatively undisturbed character typical of Cumberlain Plain Woodland.

**Likely visual impact of new development and recommendations** New development in close vicinity to Raby Road would be highly visible and likely to obscure views of remnant vegetation beyond, significantly diminishing the natural landscape character of the area.

With addition of vegetation screening some appropriate placement of new development in partially visible areas would barely be visible from the viewing location, allowing the natural landscape qualities to be maintained.

VIEWING LOCATION 13



<b>Viewing Landscape</b>	14
<b>Location Description:</b>	Raby Road approximately 50m east of the golf club entry road.
<b>View Direction:</b>	South west toward Camden Lakeside clubhouse and golf club.
<b>Existing visual and landscape qualities:</b>	<p>The viewing location allows clear views of the majority of the hillside immediately north of the clubhouse building.</p> <p>Views of parts of the grass hillside are partially obscured by some semi-mature vegetation located close to the boundary fence and immature vegetation precinct over small areas of the slope.</p> <p>The landform and vegetation block views beyond the hillside, although parts of the roof structure to the clubhouse are clearly visible.</p> <p>Toward the south east of the 320kv overhead transmission lines and a carpark light pole are visible. The carpark itself is not visible from the viewing location</p>
<b>Likely visual impact of new development and recommendations</b>	<p>The likely visual impact and effects of new development would be similar to those described for Viewing Location 13</p> <p>Due to the way in which the landform slopes down toward Raby Road exposing the hillside to full view and due to the general lack of vegetation, the area would be likely to have a limited capacity to absorb new development without significant visual impact and diminishment of the existing rural and natural character of the landscape.</p> <p>It may be possible to site new development on the hillside and mostly screen it from view with vegetation but the screening would most likely indicate to the viewer to presence of development, whilst also reducing the open feel of the landscape.</p> <p>New development located behind the hillside could be suitably screened from view and allow maintenance of the natural hillside setting.</p>

VIEWING LOCATION 14



<b>Viewing Landscape</b>	15
<b>Location Description:</b>	Raby Road approximately 50m west of the road bridge over the water supply canal.
<b>View Direction:</b>	North west along Raby Road and toward Camden Lakeside Golf Club.
<b>Existing visual and landscape qualities:</b>	<p>Views into the study area are very limited by relatively dense Cumberland Plain Woodland vegetation.</p> <p>The remnant vegetation is comprised of mature Eucalypt trees, a mixture of indigenous shrubs and an understorey of indigenous and exotic grasses.</p> <p>The vegetation community appears to be in relatively good condition with a divergent species selection and significant regrowth.</p> <p>Neither the golf course nor any other part of the study area is visible beyond the vegetation.</p> <p>In the direction of Camden Valley Way, the turnoff to the access road to the golf club is just visible.</p>
<b>Likely visual impact of new development and recommendations</b>	<p>The golf course lands are heavily screened by existing vegetation fringing the property boundary.</p> <p>Assuring retention of the vegetation, new development sited back from Raby Road would have little or no visual impact from the viewing location nor would it detract from the existing natural bush character of the area.</p>

VIEWING LOCATION 15





**Viewing Landscape** 16

**Location Description:** Raby Road approximately 150m east of the road bridge over the water supply canal

**View Direction:** West toward Camden Lakeside Golf Club.

**Existing visual and landscape qualities:** The vista from viewing location 16 is dominated by a dense patch of remnant Cumberland Plain Woodland occupying golf course lands adjacent the eastern property boundary.

Like the remnant vegetation visible from viewing location 15, the vegetation community appears to be in good condition and relatively undisturbed by human activity.

Beyond the foreground vegetation which is highly visible, there are no clear views through to the golf course lands or other parts of the study area.

**Likely visual impact of new development and recommendations** Refer to Viewing Location 15.

VIEWING LOCATION 16





Report on  
Supplementary Contamination Investigation

Proposed Residential Subdivision  
182 Raby Road, Gledswood Hills, NSW

Prepared for  
Vince and Elizabeth Pisciuneri

Project 92228.00  
October 2017

Integrated Practical Solutions





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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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Reviewer		3 October 2017



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## Executive Summary

Douglas Partners (DP) was commissioned by Vince and Elizabeth Pisciueneri c/- TN Consulting Pty Ltd (TN Consulting) to complete a Supplementary Contamination Investigation (SCI) for the south western portion of the property at 182 Raby Road, Gledswood Hills (the "Site"). The Site encompasses an approximate area of 0.1 ha of the property. The SCI is required to support a Development Application (DA) being made with Camden Council for a proposed residential subdivision.

Previous investigations by DP, including a Land Capability Assessment (LCA) completed in 2005 and a Phase 2 Contamination Assessment (Phase 2) completed in 2010 identified the Site as an Area of Environmental Concern (AEC) due to the presence of a cattle yard and shed potentially used for chemical storage. Whilst the Phase 2 concluded that no further investigation of the cattle yard was required a recent review of the Nearmap imagery indicates that the Site has since been used as a compound area for the adjacent subdivision works. The following activities have been identified as recently occurring within the compound area:

- Soil stockpiling; and
- Vehicle storage / parking activities.

Given the identified activities recently occurring at the Site and the time elapsed since the previous investigation the SCI is required to update the contamination status of the Site.

Shallow soil sampling was initially undertaken for the SCI on 28 June 2017 by completion of eight test pit excavations across the site targeting areas of potential filling, the former shed/cattle yard and the compound areas. Surface samples collected at all locations were analysed for a range of contaminants of potential concern that included total recoverable hydrocarbons, benzene, toluene, ethylbenzene and xylene, polycyclic aromatic hydrocarbons, organochlorine and organophosphorous pesticide, polychlorinated biphenyls, metals (As, Cd, Cr, Cu, Pb, Ni, Hg and Zn) and asbestos.

Results of initial SCI sampling identified the following that required further investigation:

- An ACM fragment identified on surface soils in the north eastern portion of the Site which was removed from site at time of sampling; and
- Several fibrous cement fragments (suspected ACM ) observed near a small soil/building waste stockpile in the central northern portion of the Site.

Additional sampling completed at the site did not identify further fragments or asbestos in soils in the north eastern portion of the site therefore the ACM fragment identified in the north eastern portion is considered an anomalous/isolated occurrence (since removed) and not indicative of widespread impact. Additional sampling of did not identify asbestos within any of the four additional fragments or the soil sample collected from the stockpile. The stockpile is therefore not considered to be impacted by asbestos.

Remaining COPC was not detected at concentrations above SAC in any soil samples collected from the site. From a contamination perspective, based on the findings of this SCI and previous environmental investigations, it is concluded that no further investigations or remediation works are warranted and the Site is considered suitable for the proposed development.



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**Report on Supplementary Contamination Investigation  
Proposed Residential Subdivision  
182 Raby Road, Gledswood Hills, NSW**

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## 1. Introduction

Douglas Partners (DP) was commissioned by Vince and Elizabeth Pisciuneri c/o TN Consulting Pty Ltd (TN Consulting) to complete a Supplementary Contamination Investigation (SCI) for the south western portion of the property at 182 Raby Road, Gledswood Hills (the "Site") as shown on Drawing 1 (Appendix A). The property at 182 Raby Road has an approximate area of 5,000 m<sup>2</sup> and is located within the larger Central Hills Precinct, as defined by the former Growth Centres Commission. The Site subject to this investigation comprises the south western portion of the property and encompasses an approximate area of 0.1 ha. The SCI is required to support a Development Application (DA) being made with Camden Council for a proposed residential subdivision.

Previous investigations completed by DP, including a Land Capability Assessment (LCA) completed in 2005 and a Phase 2 Contamination Assessment (Phase 2) completed in 2010 identified the Site as an Area of Environmental Concern (AEC) due to the presence of a cattle yard and shed potentially used for chemical storage. Whilst the Phase 2 concluded that no further investigation of the cattle yard was required a recent review of the Nearmap imagery indicates that the Site has since been used as a compound area for the adjacent subdivision works. The following activities have been identified as recently occurring within the compound area:

- Soil stockpiling; and
- Vehicle storage/parking activities.

Given the identified activities recently occurring at the Site and the time elapsed since the previous investigation the SCI is required to update the contamination status of the Site.

## 2. Scope of Work

DP carried out the following scope of work as part of the SCI:

- Review of previous environmental investigations and results relevant to the Site;
- Review of recent Nearmap Aerial photography to identify any areas of concern;
- A site walkover to identify any additional areas of concern (beyond those identified in the previous investigations);
- Excavation of eight test pits (TP1 to TP8) across the Site to a maximum depth of 3.0 m;
- Collection of soil samples from surface soils, where filling was encountered and from regular depth intervals based on field observation;
- Laboratory analysis of selected soil samples for commonly encountered contaminants of potential concern (COPC);
- Interpretation of results in accordance with current NSW EPA endorsed guidelines;

- Collection of additional soil and suspected ACM fragment samples from potentially contaminated areas identified from test pit sampling; and
- Preparation of this report detailing the methodology and results of the investigation and assessment of the suitability of the Site for the proposed residential land use.

### 3. Site Description

#### 3.1 Site Identification

The Site covers an approximate total area of 0.1 ha and comprises the following land parcel as detailed in Table 1 below.

**Table 1: Study Area Identification**

Lot / Deposited Plan	Current Land Use	Approx. Area (ha)
<b>182 Raby Road (Far Western Portion)</b>		
Part 102 / 1193881	Rural residential	0.1

The Site location and boundaries are shown on Drawing 1, Appendix A.

#### 3.2 Site Description

The following site description is based on a site walkover conducted by DP on 8 June 2017 and fieldworks completed by DP on 28 June 2017. Photographs taken during the site walkover and field works are presented in Photographic Plates 1 to 5, Appendix B.

At the time of the SCI, the Site consisted of a portion of a vacant property. The western half of the site was covered by grass and the eastern half unsealed exposed bare earth. The north eastern portion of the site with exposed earth was observed to be partially filled, as well as a small grass covered portion to the west, which showed different vegetation to the remainder of the site.

A small stockpile (3 m<sup>3</sup>) of soil mixed with building/demolition waste was observed in the central northern portion of the site. The building waste observed within the stockpile included fragments of fibrous cement (suspected ACM), bricks, crushed concrete, gravel and plastic. Several fragments of fibrous cement (suspected ACM) were also observed in the immediate vicinity of the stockpile. Additionally remnants of building debris were observed scattered across the site surface including timber pallets in the central eastern and north western portions of the site and a bathtub located in the central northern portion of the site. One small fragment of ACM (confirmed by the laboratory) was observed in the north eastern portion of the site.





The general topography of the Site and surrounding areas slopes gently towards the north. Overall topographic relief ranges by approximately 4 m from the highest part (approximately RL 128, relative to Australian height datum - AHD) in the southern central portion of the Site, to the lowest part (approximately RL 124) within the north eastern corner of the Site.

### 3.3 Surrounding Landuse

North:	Vacant land undergoing residential subdivision works with Gledswood Hills Drive and further subdivision development beyond.
East:	Mayfield Place with rural residential properties beyond.
South:	Mayfield Place with rural residential properties beyond.
West:	Vacant land undergoing residential subdivision works to the northwest and rural residential properties to the southwest.

### 3.4 Soil Landscapes

Reference to the Wollongong-Port Hacking 1:100 000 Soils Landscape Sheet indicates that the Site is underlain by the Blacktown soil landscape (mapping unit bt), characterised by gently undulating landscape with gently inclined slopes. Yellow, red and brown podzolic soils are characteristic of the area. Characteristics include moderately reactive, highly plastic subsoil, low soil fertility and poor soil drainage.

### 3.5 Geology

Reference to the Wollongong-Port Hacking 1:100 000 Geology Sheet indicates that the Site is underlain by Bringelly Shale (mapping unit Rwb) of the Wianamatta Group from the Triassic period. This formation typically comprises shale, carbonaceous claystone, laminite, and some minor bands of coal.

### 3.6 Hydrology and Hydrogeology

The Site slopes to the north – northeast and groundwater is expected to follow the topographic slope towards a concrete lined drainage canal located approximately 270 m north of the Site.

Investigation of urban salinity - case studies from western Sydney, UrbanSalt 2005 Conference Paper, Parramatta (McNally, 2005) describes some general features of the hydrogeology of Western Sydney which are relevant to this Site. The shale terrain of much of Western Sydney is known for saline groundwater, resulting either from the release of connate salt in shales of marine origin or from the accumulation of windblown sea salt.



## 4. Background

The following reports have previously been prepared for the Site:

- DP Report on Land Capability and Contamination Assessment, Proposed Development 'Central Hills' - Catherine Field, NSW Project 40470 dated 21 November 2005, (the Land Capability Assessment; DP 2005); and
- DP Report on Phase 2 Contamination Assessment, Gledswood Homestead and Rural Properties, Catherine Field, NSW, Project 40470.10 dated 29 January 2010 (DP, 2010).

### 4.1 DP (2005) Land Capability Assessment

DP completed a LCA for the larger Central Hills Precinct, which included the current Site, in November 2005. The LCA included Phase 1 contamination assessment with limited surface and groundwater water sampling. The investigation also included site history searches, site inspection, non-intrusive and intrusive site investigation, laboratory testing of selected samples, engineering analysis and reporting.

The historical information indicated that the Central Hills Precinct has been used for agricultural, recreational and rural residential purposes during the period from 1941 to 2005. Based on the historical information a number of AEC were identified across the Central Hills Precinct which required targeted investigations. One AEC was identified within the current Site boundary due to the presence of a cattle yard and shed.

A review of the Central Hills Precinct's hydrogeology was also undertaken as part of the Land Capability Assessment. The review examined regional groundwater, with limited investigation of surface water and groundwater. The monitoring well locations were selected on a catchment basis using geographical information system (GIS) interpretation of the topographic data. The bores were placed at the inferred exit points of the major catchments. No bores were located within the current Site boundary.

Groundwater and surface water samples collected from the Central Hills Precinct were analysed at the laboratory for a range of common chemical contaminants comprising heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), polycyclic aromatic hydrocarbons (PAH), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylene (BTEX), polychlorinated biphenyls (PCB), organochlorine pesticide (OCP) and organophosphorous pesticide (OPP). All analytes returned results within the relevant guidelines with the exception of heavy metals. Copper and zinc levels were elevated above the guidelines, however, this was expected in waters from the western Sydney region with a dominant shale geology. In general, there was no indication of contamination and the results supported the findings of a low potential for contamination.



## 4.2 DP (2010) Phase 2 Contamination Assessment

DP (2010) completed a Phase 2 in 2010 further investigating the eastern, southern and western properties of the larger Central Hills Precinct which included the current Site (referred to as AEC 14 in the Phase 2). The investigation comprised intrusive sampling and analysis of soil samples for a range of identified potential contaminants. The investigation targeted AEC that were identified during the Land Capability Assessment. Seven samples were collected within the current Site boundary (14 - 1 to 14 - 7) from shallow soils at depths between 0.0 - 0.2 m. The locations of these samples are shown on the figure presented in Appendix C. The analytical results of these samples have been utilised for this assessment and are included in Table D1, Appendix D.

## 5. Site History Summary

The following site history summary is based on the findings of previous investigations and a recent review of recent Nearmap Aerial Photography from 2005 onwards undertaken as part of this SCI.

### 5.1 Pre 2005

Based on the information provided in DP (2005), the Site and surrounds were generally used for agricultural and rural residential purposes during the period from 1941 to 2005. A cattle yard and shed appear to have been constructed on the site sometime between 1966 and 1979.

### 5.2 2005 to 2015

Since the completion of DP (2005), the Site and surrounds continued to be used for rural residential purposes. The review Nearmap imagery indicated that the site remained relatively unchanged since 2005 to 2015.

### 5.3 2015 to present

Nearmap imagery indicates that sometime between August and November 2015 subdivision construction works appear to have begun in the area directly to the north of the site. Large areas to the north of the site have been stripped of vegetation and there are indications of bulk earthworks being carried out. During this period the cattle yard was removed from the Site and the Site appears to be used as a site compound associated with the adjacent subdivision. Soil stockpiles and parked motor vehicles were observed within this compound area. The shed was removed between January and May 2017.

In addition, during the site walkover undertaken as part of this SCI (refer Section 6), it was noted that site conditions appeared to be similar to those reported in previous investigations, with the exception of the shed and cattle yard being removed.

## 6. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors (linkages). A preliminary CSM provides a framework to identify potential contamination sources and how potential receptors may be exposed to contamination either in the present or the future (i.e. it enables an assessment of the potential source - pathway - receptor linkages).

### 6.1 Potential Sources

Based on the review of site history information and the site walkover, the identified potential sources, description of sources and contaminants of potential concern (COPC) at the Site have been summarised in Table 1.

**Table 1: Potential Contamination Sources and COPC**

Potential Source	Description of Potential Source	Contaminants of Potential Concern
Site Compound / Demolition (S1)	<p>Shed once located within the site was used as a site compound during construction and then was demolished.</p> <p>There is also potential for alterations to the building including renovations and degradation of paints.</p> <p>There is therefore potential for hazardous building materials being present within the near surface soils surrounding the former shed structure.</p>	Hazardous building material related COPC include asbestos and lead
Site Compound / Chemical or fuel storage (S2)	The Site was used for agricultural purposes until recently and then as part of the compound associate with the nearby subdivision. There is potential for chemicals and fuel storage within the shed and nearby cattle yard areas	Chemical and fuel related COPC include Metals, TRH, BTEX, PAH and OCP and OPPs
Import of Fill and Fly tipping waste (S3)	The Nearmap aerial photograph review indicates that filling may have been imported from an unknown origin and placed in the north eastern and western portions of the Site	COPC commonly associated with fill of an unknown origin include Metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols, and asbestos

Notes: *Metals - comprising arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn);*

*TRH - Total recoverable hydrocarbons;*

*BTEX - Benzene, toluene, ethylbenzene and xylene;*

*PAH - Polycyclic aromatic hydrocarbons;*

*OCP and OPP - Organochlorine and organophosphorous pesticides;*

*PCB - Polychlorinated biphenyls;*



## 6.2 Potential Receptors

The following potential human receptors (R) have been identified for the Site:

- R1 – Construction and maintenance workers (during Site redevelopment);
- R2 – Future site users following development of the Site; and
- R3 – Land users in adjacent areas (residential).

The following potential ecological receptors (R) have been identified for the Site:

- R4 – Local groundwater;
- R5 – Surface water bodies (creeks); and
- R6 – Terrestrial ecology.

## 6.3 Potential Pathways

Potential pathways for contamination include the following:

- P1 – Ingestion and dermal contact;
- P2 – Inhalation of fibres and/or dust and/or vapours;
- P3 – Leaching of contaminants and vertical migration into groundwater;
- P4 – Surface water run-off;
- P5 – Lateral migration of groundwater providing base flow to watercourses; and
- P6 – Direct contact with terrestrial ecology.

## 6.4 Summary of Potential Complete Pathways

A 'source – pathway – receptor' approach has been used to assess the potential risks of harm being caused to human or ecological receptors from contamination sources on or in the vicinity of the Site, via exposure pathways. The possible pathways between the above sources (S1 to S3) and receptors (R1 to R6) are provided in Table 2 below. Assessment of the preliminary CSM was used to determine data gaps and the requirement for sampling and analysis to assess the suitability of the Site for the proposed residential use.

Table 2: Preliminary Conceptual Site Model

Source	Exposure Pathway	Receptor	Requirement for Additional Data and / or Management
S1: Site Compound / Demolition	P1 – Ingestion and dermal contact; P2 – Inhalation of fibres and/or dust and/or vapours	R1 – Construction and maintenance workers. R2 – Future site users following development of the site.	<p>Given the identified potential contaminant sources the initial fate (lay down mechanism) of potential contaminants is likely to be expressed firstly in surface soils.</p> <p>An intrusive investigation is therefore required to quantify and assess potential contamination impact to surface soils.</p> <p>(A further assessment of deeper soils and groundwater may be deemed necessary should significant contamination be identified in surface soils).</p>
S2: Site Compound / Potential Chemical and fuel storage	P2 – Inhalation of fibres and/or dust and/or vapours	R3 – Land users in adjacent areas.	
S3: Import of Fill and Fly Tipping Waste	P3 – Leaching of contaminants and vertical migration into groundwater.	R4 – Local groundwater and receiving water bodies.	
	P4 – Surface water run-off. P5 – Lateral migration of groundwater providing baseflow to watercourses.	R5 – Surface water bodies.	
	P6 – Direct contact with terrestrial ecology.	R6 – Local ecology.	

## 7. Soil Sampling

### 7.1 Sampling and Analysis Rationale

Field investigations for the SCI were undertaken by a DP environmental scientist on 28 June 2017.

Eight test pits (TP1 to TP8) were excavated with a John Deere 315SE Backhoe fitted with a 450 mm toothed bucket across the site. Six of the test pits (TP3 to TP8) were completed targeting areas of potential filling and the former shed/cattle yard in the eastern half of the site. Two test pits (TP1 and TP2) were completed in relatively undisturbed (background) areas in the western half of the site. The number of test pit locations exceeds the minimum number of sampling points recommended for a site of 0.1 ha by NSW EPA (1995) *Contaminated Sites - Design Guidelines* for the site area. Test pit locations are presented on Drawing 2 (Appendix A).

With the exception of test pit TP2 all test pits were excavated through fill soils and into underlying natural material. TP2 was excavated into natural material. Given the potential for shallow soil impact from identified COPC surface samples were collected at all locations (0.0 - 0.1 mbg). Additional samples were also collected at depth based on field observations. All surface samples from the test pits were tested for the COPC identified in the CSM (refer Tables 1 and 3).

One fragment (F1) of suspected ACM was observed on surface soils in the north eastern portion of the site and collected for laboratory analysis. Another fragment (F2) was collected from the vicinity of the soil/building waste stockpile (with several other suspected ACM fragments from nearby) in the central northern portion of the site. Both fragments (F1 and F2) were sent to the laboratory for asbestos identification analysis.

The adopted Data Quality Objectives are provided in Appendix E.

**Table 3: Summary of Sampling and Analysis Rationale**

Location	Sample Depth	TP depth (m bgl)	Depth of filling (m bgl)	Analytes	Location Target	Sample Target
TP1	0 – 0.1	3.0	0.3	Metals, PAH, Phenols, TRH, BTEX, ASB	Background / Filling	Filling
TP2	0 – 0.1	0.9	N/A	Metals, PAH, TRH, BTEX	Background	Topsoil
TP3	0 – 0.05	2.4	0.05	Metals, PAH, TRH, BTEX	Filling / Compound area	Filling
TP4	0 – 0.1	1.0	0.2	Metals, PAH, Phenols, TRH, BTEX, ASB	Filling / Compound area	Filling
TP5	0 – 0.1	2.8	0.2	Metals, PAH, Phenols, TRH, BTEX, ASB	Filling / Compound area	Filling
TP6	0 – 0.1	1.1	0.2	Metals, PAH, TRH, BTEX, OCP, OPP, PCB	Filling / Compound area	Filling
TP7	0 – 0.1	1.0	0.1	Metals, PAH, Phenols, TRH, BTEX, OCP, OPP, PCB, ASB	Filling / Compound area	Filling
TP8	0 – 0.1	1.0	0.3	Metals, PAH, Phenols, TRH, BTEX, OCP, OPP, PCB, ASB	Filling / Compound area	Filling
F1	Fragment of suspected ACM collected from surface soils in the north eastern portion of the site			ASB	-	-

Location	Sample Depth	TP depth (m bgl)	Depth of filling (m bgl)	Analytes	Location Target	Sample Target
F2	Fragment of suspected ACM collected from within a scatter of several fragments identified on surface soils in the vicinity of a stockpile of soil and building waste in the central northern portion of the site			ASB	-	-

Notes: *Metals - comprising arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn);*

*TRH - Total recoverable hydrocarbons;*

*BTEX - Benzene, toluene, ethylbenzene and xylene;*

*PAH - Polycyclic aromatic hydrocarbons;*

*OCP and OPP - Organochlorine and organophosphorous pesticides;*

*PCB - Polychlorinated biphenyls;*

## 8. Sampling Procedure and QA/QC

Sampling data was recorded to with reference to with routine Chain-of-Custody requirements and DP's standard operating procedures. The general sampling, handling, transport and tracking procedures are detailed below:

- Sample locations were located in the field using aerial imaging;
- Collection of soil samples was completed using disposable sampling equipment (new nitrile glove for each sample) from the bucket of the backhoe. Samples were collected taking care to not include soil that was directly in contact with either the surface of bucket;
- Samples were placed into new laboratory prepared glass jars, with minimal headspace, and sealed with a Teflon lined lid. In addition, 500 g bag samples were collected for asbestos testing;
- Sample containers were labelled with individual and unique identification including project number, sample ID, depth and date of sampling; and
- Logs were completed for all test pits. Test pit logs included, where relevant, sample identification, coordinates, date of collection, a description of the substrate conditions encountered, visual or olfactory evidence of contamination, the depth of samples collected, QA/QC samples collected, the sampler and equipment used.

### 8.1 Sample Analysis and Laboratory Quality Assurance / Quality Control

Samples designated for analysis were dispatched to NATA accredited laboratory Envirolab Services at Chatswood NSW for analysis of primary samples and intra-laboratory replicates. Samples were received by the laboratory in good condition, accompanied by the chain-of-custody documentation with the analysis requested.





Envirolab is accredited by the National Association of Testing Authorities (NATA) and is required to conduct in-house QA/QC procedures. These are normally incorporated into every analytical run and include assessment of reagent blanks, spike recovery, surrogate recovery and laboratory duplicates.

The analytical methods used are summarised in the laboratory certificate of analysis, included in Appendix F.

## 9. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in this SCI have been informed by the proposed land use (i.e. residential with accessible soils) and the CSM - which identified human and ecological receptors to potential contamination on the site (refer to Section 7). Analytical results were assessed (as a Tier 1 assessment) against the investigation and screening levels as per Schedule B1, National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (NEPC, 2013).

As the Site is proposed to be subdivided for residential land use, the investigation and screening levels adopted are consistent with a generic residential land use scenario with accessible soil. The derivation of the SAC is included in Appendix E and the adopted SAC are listed in the analytical results table (Table D1 in Appendix D).

## 10. Results

### 10.1 Field Work Observations

The test pit logs are included in Appendix G, together with notes defining classification methods and descriptive terms.

Relatively uniform conditions were encountered across the Site, with filling observed at the majority of test pit locations. The general strata across the Site are consistent with the DP (2010) findings and are summarised as follows:

- **FILLING** – Filling was encountered at locations TP1, TP3, TP4, TP5, TP6, TP7 and TP8 from the surface to a depth of approximately 0.3 m bgl. Filling generally comprised dark brown, brown/red clayey silt with trace siltstone cobbles, concrete, tile, basaltic gravel and timber. In TP1 filling comprised red and grey silty clay and clayey silt with some siltstone gravel; overlying
- **SILTY CLAY** – Red/brown silty clay was encountered in all test pits to depths of 2.1 m, 1.8 m, 2.6 m and 0.9 m in TP1, TP3, TP5 and TP8 respectively, and to the depth of test pit termination in all remaining pits; overlying
- **ROCK (Siltstone)** – Extremely low strength to low strength, extremely weathered to highly weathered dark brown, grey and red siltstone with some ironstone banding was encountered in TP 1, TP 3, TP 5 and TP to depths of 0.9 m and 3.0 m or depth of test pit termination.

Filling was not encountered at test pit location TP2. Dark brown clayey silt topsoil was encountered to 0.05 m bgl at location TP2 overlying dark brown clayey silt to a depth of 0.2 m bgl.



No free groundwater was observed in any of the test pits during excavation or for the short time that they were left open.

## 10.2 Laboratory Analytical Results

The laboratory analytical results for the soil samples collected during this SCI and DP (2010) are summarised in Table D1 in Appendix D, together with the adopted SAC. The laboratory certificate of analysis for this SCI is provided in Appendix F.

### TRH and BTEX

TRH was detected at concentrations exceeding laboratory limits of reporting (LOR) but below SAC in the soil sample collected from TP7 at a depth of 0 - 0.1 m bgl.

TRH and BTEX were not detected at concentrations exceeding LOR in remaining soil samples analysed.

### PAHs

Benzo(a) Pyrene (BaP) and total PAHs were detected at concentrations exceeding LOR but below SAC in the soil sample collected from TP3 at a depth of 0 - 0.05 m bgl.

Total PAHs were also detected at concentrations exceeding LOR but below SAC in the soil sample collected from TP7 at a depth of 0 - 0.1 m bgl.

PAHs were not detected at concentrations exceeding LOR in remaining soil samples analysed.

### Heavy Metals

Heavy metals were not detected at concentrations exceeding SAC in any soil samples analysed.

### OCPs, OPPs, PCBs and Phenols

OCPs, OPPs and PCBs were not detected at concentrations exceeding LOR in any soil samples analysed.

### Asbestos

Asbestos was detected by the laboratory as chrysotile asbestos in the fibre cement sample (F1) collected from the surface in the north eastern portion of the site.

Laboratory analysis of the fragment of suspected ACM (F2) collected within stockpile in the central northern portion of the site did not identify asbestos in the fragment.

Asbestos was not detected in any soil samples analysed.



### 10.3 Quality Assurance and Quality Control

A review of the adopted QA/QC procedures and results (Appendix H) indicates that the DQIs have generally been met. On this basis, the sampling and laboratory methods used during the investigation were found to meet DQOs for this project.

## 11. Additional Sampling

Additional sampling was completed at the site on 13 September 2017 due to the identification of the following Issues of Environmental Concern as described below. Sampling locations are presented on Drawing 3 (Appendix A).

### 11.1 Fragment of ACM in Northeast Portion of Site

Asbestos was detected by the laboratory as chrysotile asbestos in the fragment of FCS (F1) collected from the surface in the north eastern portion of the site. Whilst no other fragments were visibly identified on surface soils in the immediate vicinity further assessment for any additional fragments that may have been buried or existed within fill in the vicinity of F1 was undertaken.

To determine whether the identified fragment of ACM was an anomalous/isolated fragment or indicative of wide-spread ACM impact of fill soils in the north eastern portion of the site the following was completed:

- A thorough walkover on an approximate 3 m grid was completed across the north eastern portion of the site to confirm absence of ACM fragments on the site surface;
- Four 500 mL samples were collected from the near surface (0.0 - 0.1 m) in the fill soils at locations 1m north (SS1-FN), south (SS4-F1S), east (SS2-F1E) and west (SS5-F1W) of location F1;
- One 500 mL sample (SS1-F1) was also collected from the near surface (0.0 - 0.1 m) in fill soils at location F1; and
- The samples were sent for laboratory asbestos analysis (% w/w).

### 11.2 Suspected ACM in Stockpile in Northern Central Portion of Site

Numerous suspected ACM fragments (fibrous cement) were also observed in the vicinity of a small stockpile of mixed soil/building waste of approximately 3 m<sup>3</sup> in the central northern portion of the site. Whilst laboratory analysis of a fragment (F2) collected from the vicinity of the stockpile did not identify asbestos the presence of asbestos in other nearby fragments could be ruled out given:

- The fragments appeared to be of varied types and ages;
- Many of the fragments exhibited traits commonly associated with ACM (e.g. distinct dimple patterns, visible fibres); and
- The detected presence of asbestos within the fragment (F1) of ACM collected approximately 30 m to the northeast of the stockpile area.



To further investigate the presence of asbestos in fragments in the vicinity of the stockpile the following was completed:

- Collection of four additional fragment samples (F3 to F6) in the vicinity of the soil/building waste stockpile to confirm the presence or absence of asbestos. Samples were collected based on physical differences between the fragments to ensure samples were representative of the different materials encountered;
- Collection of one 500 mL soil sample (S1) from the soil stockpile; and
- Submission of fibrous cement fragments and the soil sample to the laboratory for asbestos identification.

To confirm the presence/ absence of other fill related COPC the soil sample (S1) was additionally analysed for TRH, BTEX, PAHs, metals and OCPs.

### 11.3 Additional Sampling Laboratory Analytical Results

The laboratory analytical results for the samples collected during additional sampling are also summarised in Table D1 in Appendix D, together with the adopted SAC. The laboratory certificate of analysis for additional sampling is also provided in Appendix F.

#### Asbestos

Laboratory analysis of the four fragments of suspected ACM collected in the vicinity of the stockpile in the central northern portion of the site did not identify asbestos in any of the fragments.

Asbestos was not detected in any corresponding soil samples analysed.

#### Other Fill Related COPC in Soil Stockpile

Laboratory analysis did not detect other fill related COPC at concentrations exceeding SAC in the soil sample (S1) collected from the stockpile.

## 12. Discussion

### 12.1 ACM Fragment in North Eastern Portion of Site

Laboratory analysis of a fragment (F1) of fibre cement material collected during the initial sampling from surface soils in the north eastern portion of the site identified chrysotile asbestos within the material. The fragment of ACM is considered to be isolated occurrence and not indicative of widespread impact given:

- Site walkover undertaken during initial sampling and additional sampling did not identify any additional fragments on the site surface across the north eastern portion of the site;
- Further near surface sampling at and surrounding F1 did not identify asbestos within soil samples collected approximately 1m north, east, south and west of F1 and at the location of F1; and
- The only fragment of ACM found was removed for laboratory testing.



## 12.2 Suspected ACM Fragments in the Vicinity of Soil Stockpile

Numerous suspected ACM fragments were also observed in the vicinity of a stockpile of mixed soil/building waste in the central northern portion of the site. Laboratory analysis of the fragment (F2) collected in the initial sampling, plus four additional fragments (F3 to F6) and the 500 mL soil sample collected in the vicinity of the stockpile did not identify asbestos within any of the samples. The stockpile is therefore not considered to be impacted by asbestos.

## 13. Conclusions and Recommendations

The results of the SCI and previous investigations have identified that the site and surrounds have a history of rural residential land-use with recent use of the Site as a compound for adjacent subdivision works. The investigations have identified the following activities that have the potential for contamination of surface soils at the site:

- A former shed and cattle yard on the Site;
- Potential use of the former shed for chemical/fuel storage; and
- Stockpiling of soils and vehicle storage on the Site during recent use of the Site as a compound for the adjacent subdivision works.

Shallow soil sampling initially undertaken for the SCI at eight locations across the Site in the compound areas and former shed and cattle yard identified the following that required further investigation:

- An ACM fragment identified on surface soils in the north eastern portion of the Site; and
- Several suspected ACM fragments observed near a soil/building waste stockpile in the central northern portion of the Site.

Additional sampling completed at the site did not identify further fragments or asbestos in soils in the north eastern portion of the site therefore the ACM fragment identified in the north eastern portion is considered an anomalous/isolated occurrence (since removed) and not indicative of widespread impact. Additional sampling did not identify asbestos within any of the four additional fragments or the soil sample collected from the stockpile. The stockpile is therefore not considered to be impacted by asbestos.

Remaining COPC were not detected at concentrations above SAC in any soil samples collected from the site. From a contamination perspective, based on the findings of this SCI and previous environmental investigations, it is concluded that no further investigations or remediation works are warranted and the Site is considered suitable for the proposed development.



#### 14. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report (or services) for this project at 182 Raby Road, Gledswood Hills in accordance with DP's proposal dated 7 April 2017 and acceptance received from Vince Pisciueneri dated 2 June 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Vince and Elizabeth Pisciueneri for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

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**Douglas Partners Pty Ltd**

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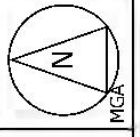
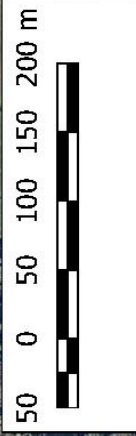
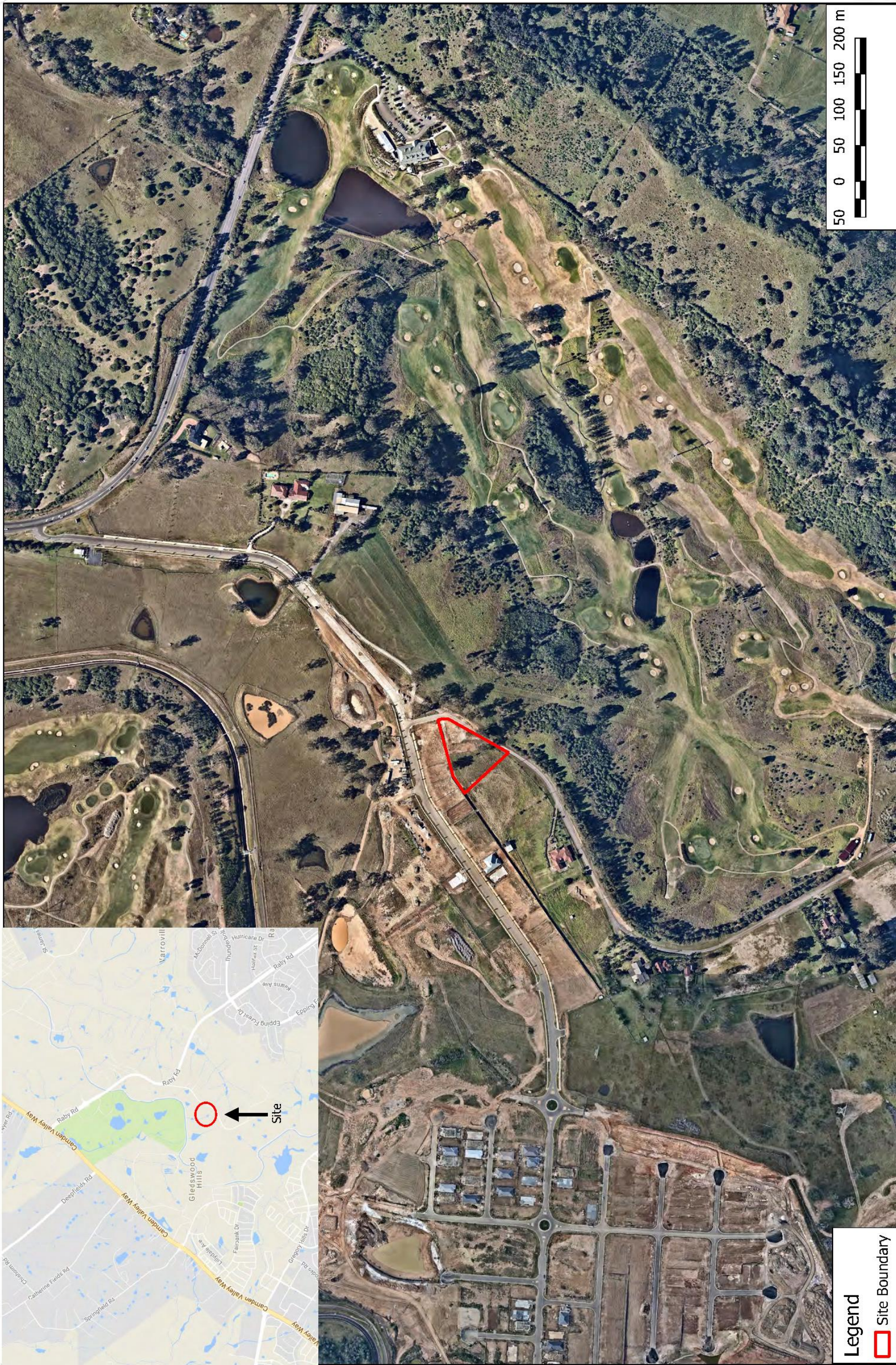
Attachment 8

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**Appendix A**

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Drawings 1 to 3



PROJ: 92228.00  
DRAWING No: 1  
REVISION: A

**Site Locality**  
**Proposed Residential Subdivision**  
**182 Raby Road, Gledswood Hills, NSW**

CLIENT: TN Consulting Pty Ltd  
OFFICE: Macarthur  
SCALE: AS shown  
DRAWN BY: LOC  
DATE: 09/08/2017

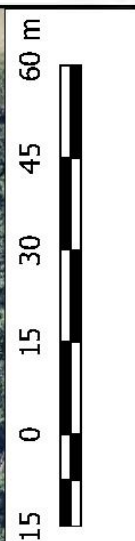
**Legend**  
□ Site Boundary



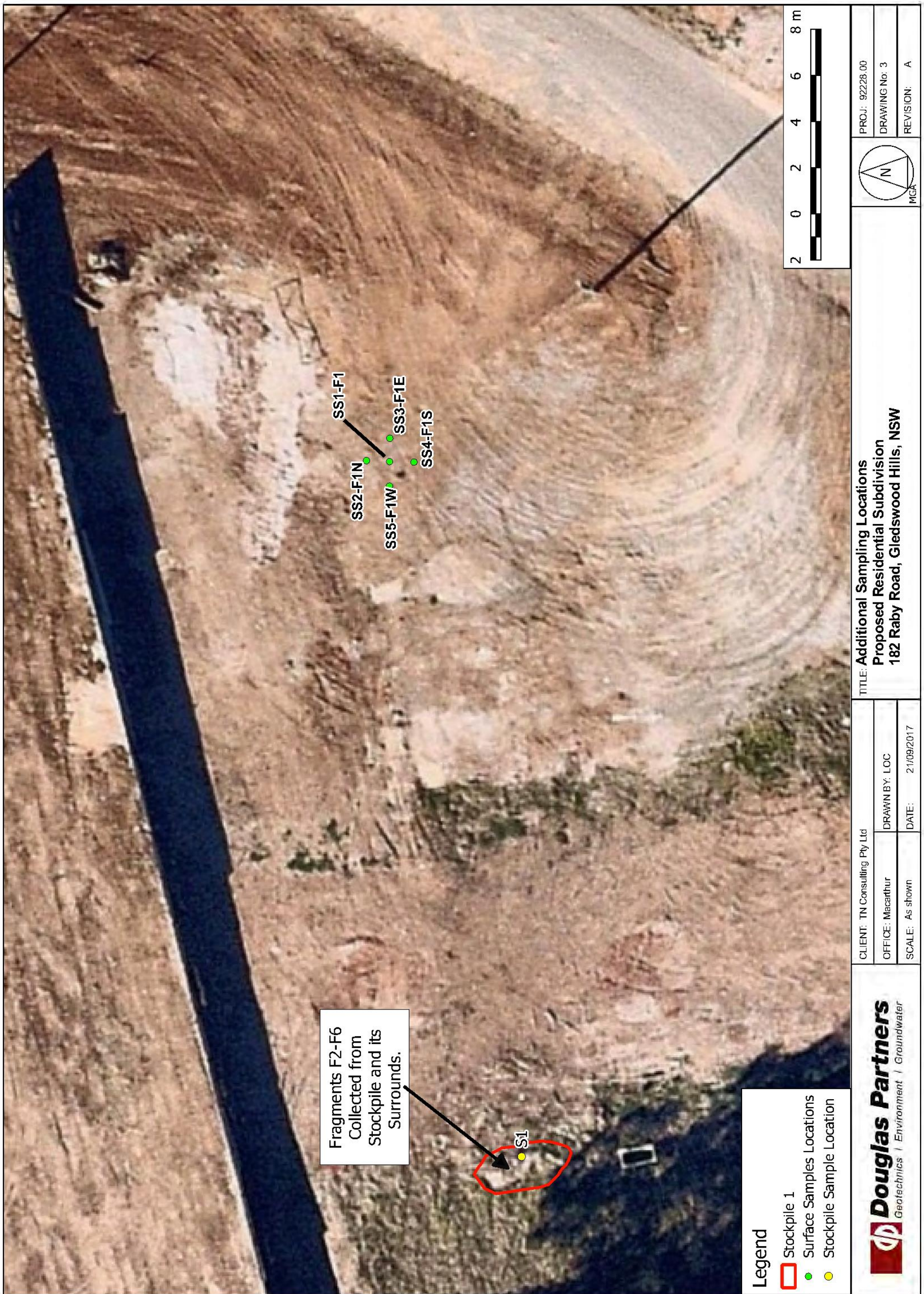




**Legend**  
 ■ Test Pit Location  
 □ Site Boundary



	CLIENT: TN Consulting Pty Ltd OFFICE: Macarthur SCALE: As shown	DRAWN BY: SJL DATE: 21/06/2017	TITLE: <b>Sample Plan Layout</b> <b>Proposed Residential Subdivision</b> <b>182 Raby Road, Gledswood Hills, NSW</b>	PROJ: 92228.00 DRAWING No: 2 REVISION: A





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**Appendix B**

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Site Photographs



Photograph 1 - North eastern portion of the site with Mayfield Place and rural residential properties beyond.



Photograph 2 - Eastern portion of site.


	Site Photographs	PROJ: 92228.00
	Supplementary Contamination Investigation	PLATE: 1
	182 Raby Road, Gledswood Hills	REV: A
	CLIENT: Vince and Elizabeth Pisciuneri	DATE: 10.08.2017



Photograph 3 - Northern portion of site with timber fence along northern boundary.



Photograph 4 - Soil / building waste stockpile located in central northern portion of site. Several fragments of fibrous cement material observed in vicinity of stockpile.


	Site Photographs	PROJ: 92228.00
	Supplementary Contamination Investigation	PLATE: 2
	182 Raby Road, Gledswood Hills	REV: A
	CLIENT: Vince and Elizabeth Pisciuneri	DATE: 10.08.2017



Photograph 5 - Fragments of fibrous cement material in the immediate vicinity of stockpile in central northern portion of site.



Photograph 6 - Western portion of site.


	Site Photographs	PROJ: 92228.00
	Supplementary Contamination Investigation	PLATE: 3
	182 Raby Road, Gledswood Hills	REV: A
	CLIENT: Vince and Elizabeth Pisciueneri	DATE: 10.08.2017



Photograph 7 - Mayfield Place with rural residential properties beyond to the southeast of the site.



Photograph 8 - South eastern portion of site.

 <b>Douglas Partners</b> <small>Geotechnics   Environment   Groundwater</small>	Site Photographs	PROJ: 92228.00
	Supplementary Contamination Investigation	PLATE: 4
	182 Raby Road, Gledswood Hills	REV: A
	CLIENT: Vince and Elizabeth Pisciuneri	DATE: 10.08.2017






Photograph 9 - Fragment of ACM on surface soils in north eastern portion of site.



Photograph 10 - Test pit 4 completed in north eastern portion of site.

	Site Photographs	PROJ: 92228.00
	Supplementary Contamination Investigation	PLATE: 5
	182 Raby Road, Gledswood Hills	REV: A
	CLIENT: Vince and Elizabeth Pisciuneri	DATE: 10.08.2017

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**Appendix C**

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Phase 2 Sample Locations



**Douglas Partners**  
 Geotechnics . Environment . Groundwater

Brisbane, Cairns, Campbelltown, Canberra, Darwin, Gold Coast, Melbourne,  
 Newcastle, Perth, Sydney, Townsville, Wollongong, Wyong

Title: **SAMPLE LOCATIONS - AEC 14**  
**PHASE 2 CONTAMINATION ASSESSMENT**  
**GLEDSWOOD HOMESTEAD & RURAL PROPERTIES**

Client: SH Camden Valley Pty Ltd		Office: Wollongong
Drawn by: DBY	Scale: As Shown	Project Number: 40470.10
Approved by: NLE	Date: 10/09/2009	Drawing No: <b>17</b>

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**Appendix D**

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Laboratory Results Summary Table D1







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**Appendix E**

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Data Quality Objectives and Site Assessment Criteria





## Appendix E - 1 Data Quality Objectives

The SCI has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

### E1.1 State the Problem

Vince and Elizabeth Pisciueneri are considering redeveloping the site for residential purposes. Desktop studies have identified that the site has recently been used as a site compound for the nearby residential subdivision works. The following potentially contaminating activities have been identified occurring onsite that have the potential to impact surface soils at the site:

- Former shed on site – potential for hazardous materials;
- Former shed on site – potential for storage of chemicals and fuel;
- Former use of the site as a cattle yard;
- Vehicle storage and parking; and
- Imported fill or fly tipping of waste of an unknown origin.

The “problem” to be addressed is the extent and nature of potential contamination at the site and whether the site is suitable for the proposed development.

The objectives of the investigation are as follows:

- Assess the contamination status of the site and the suitability of the site, from a contamination standpoint, for the proposed residential development.

### E1.2 Identify the Decision/Goal of the Study

The suitability of the site for the proposed residential development was assessed based on the findings of the site walkover and a comparison of the analytical results for contaminants of potential concern (COPC) with the adopted site assessment criteria (SAC). The adopted SAC are provided in Section E2 below.

Based on the past land use, the main COPC are expected to be total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), heavy metals and asbestos. Other commonly found contaminants which may be present include phenols, organophosphate pesticides (OPP) and polychlorinated biphenyls (PCB).

The following specific decisions were considered as part of the SCI:

- Did field observation and analytical results identify potential contamination sources (AEC) which were not included in the preliminary CSM?
- Were COPC present in soil at concentrations that pose a potential risk to identified receptors?



- Is the data sufficient to make a decision regarding the abovementioned risks, the suitability of the site for the proposed development?
- Does contamination at the site, if encountered, trigger the Duty to Report requirements under the CLM Act 1997?
- Are there any off-site migration issues that need to be considered?

### E1.3 Identify Information Inputs

Inputs into the decisions are as follows:

- Review of regional geology, topography and hydrogeology information;
- Review of site history information;
- Completion of a site inspection;
- Soil samples were collected in the immediate vicinity of identified potential sources of contamination (AEC) across the Site from a total of 11 test pits locations and surface soils sample locations;
- The lithology of the Site as described in the test pit logs (Appendix E);
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the SCI (Appendix H);
- All analysis was undertaken at a NATA accredited laboratory; and
- Laboratory reported concentrations of contaminants of concern were compared with the NEPC (2013) criteria as discussed in Section D2.

### E1.4 Define the Study Boundaries

The site is identified as Part lot 102 in DP 1193881, within the local government area of Camden Council and comprises approximately 0.1 hectare. The Site location and boundaries are shown on Drawing 1, Appendix A.

The investigation was undertaken to a maximum depth of 3.0 m below ground level (bgl) across the Site.

Field investigations were undertaken on 28 July 2017 by a DP Environmental Scientist.

### E1.5 Develop the Analytical Approach (or decision rule)

The information obtained during the assessment was used to characterise the Site in terms of contamination issues and risk to human health and the environment. The decision rules used in characterising the site were as follows:

- The adopted SAC was the NSW Environment Protection Authority (EPA) endorsed criteria; and
- The contaminant concentrations in soil were compared to the adopted SAC to determine whether further investigation or remedial action was required.



Field and laboratory test results were considered useable for the assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the ‘true’ value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

The specific limits are outlined in the data QA/QC procedures and results (Appendix G).

### E1.6 Specify the Performance or Acceptable Criteria

Decision errors for the respective COPC for fill and natural soils are:

1. Deciding that fill and natural soil at the Site exceeds the adopted SAC when they truly do not; and
2. Deciding that fill and natural soil at the Site is within the adopted SAC when they truly do not.

Decision errors for the SCI were minimised and measured by the following:

- The sampling regime targeted each stratum identified to account for site variability;
- Sample collection and handling techniques were in accordance with DP’s *Field Procedures Manual*;
- Samples were prepared and analysed by a NATA-accredited laboratory with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in NEPC (2013);
- The analyte selection is based on the available site history, past site activities and site features. The potential for contaminants other than those proposed to be analysed is considered to be low;
- The SAC were adopted from established and NSW EPA endorsed guidelines. The SAC have risk probabilities already incorporated; and
- A NATA accredited laboratory using NATA endorsed methods are used to perform laboratory analysis. Where NATA endorsed methods are not used, the reasons are stated. The effect of using non-NATA methods on the decision making process are explained.

### E1.7 Optimise the design for obtaining data

Sampling design and procedures that were implemented to optimise data collection for achieving the DQOs included the following:

- A NATA accredited laboratory using NATA endorsed methods were used to perform laboratory analysis;

- Additional soil samples were collected but kept 'on hold' pending details of initial analysis so that they could be analysed if further delineation was required; and
- Adequately experienced environmental scientists/engineers were chosen to conduct field work and sample analysis interpretation.

## Appendix E – 2 - Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation are informed by the preliminary CSM which identified human and environmental receptors to potential contamination on the site (refer to Section 7). Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising investigation and screening levels as per Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended 2013 (NEPC, 2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario with accessible soils.

### E2.1 Health Investigation and Screening Levels

The generic Health Investigation Levels (HILs) and Health Screening Levels (HSLs) are considered to be appropriate for the assessment of human health risk associated with contamination at the site. The adopted soil HILs and HSLs for the potential contaminants of concern are presented in Table D2, with inputs into their derivation shown in Table D1.

As shown in Table D2 the adopted HSLs are based on a potential vapour intrusion pathway, as identified in the CSM. Although the CSM also identifies a direct contact pathway as well as construction worker receptors, the corresponding HSLs are significantly higher than those for the vapour intrusion pathway and are therefore not drivers for further assessment and/or remediation. As such the direct contact and intrusive maintenance worker HSLs have not been listed.

**Table E1: Inputs to the Derivation of HSLs**

Variable	Input	Rationale
Potential exposure pathway	Inhalation of vapours	Potential exposure pathways
Soil Type	Silt and clay	Dominant soil type in surface soils (see Test Pit Logs – Appendix E)
Depth to contamination	0 m to <1 m	Potential contamination sources likely to impact surface soils

Table E2: HIL and HSL in mg/kg Unless Otherwise Indicated

Contaminants		HIL- A	HSL- A & B
Metals	Arsenic	100	-
	Cadmium	20	-
	Chromium (VI)	100	-
	Copper	6000	-
	Lead	300	-
	Mercury (inorganic)	40	-
	Nickel	400	-
	Zinc	7400	-
PAH	Benzo(a)pyrene TEQ <sup>1</sup>	3	-
	Total PAH	300	-
	Naphthalene	-	4
TRH	C6 – C10 (less BTEX) [F1]	-	40
	>C10-C16 (less Naphthalene) [F2]	-	230
	>C16-C34 [F3]	-	-
	>C34-C40 [F4]	-	-
BTEX	Benzene	-	0.6
	Toluene	-	390
	Ethylbenzene	-	NL <sup>3</sup>
	Xylenes	-	95
OCP	Aldrin + Dieldrin	6	-
	Chlordane	50	-
	DDT+DDE+DDD	240	-
	Endosulfan	270	-
	Endrin	10	-
	Heptachlor	6	-
	HCB	10	-
	Methoxychlor	300	-
OPP	Chlorpyrifos	160	-
PCB <sup>2</sup>		1	-

## Notes:

- 1 Sum of carcinogenic PAH
- 2 Non dioxin-like PCBs only.
- 3 The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

## E2.2 Ecological Investigation Levels

Ecological Investigation Levels (EILs) and Added Contaminant Limits (ACLs), where appropriate, have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. The adopted EILs, derived using the *Interactive (Excel) Calculation Spreadsheet* (Standing Council on Environment and Water (SCEW) website (<http://www.scew.gov.au/node/941>)) are shown in the following Table D4, with inputs into their derivation shown on Table D3.

**Table D3: Inputs to the Derivation of EILs**

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Given the potential sources of soil contamination are from historic use, the contamination is considered as "aged" (>2 years);
pH	4.7	17 selected samples were tested for pH during a salinity investigation for the site. The lowest pH value has been used as an initial screening. The pH value adopted is a pH of 4.7.
CEC	7.4 cmolc/kg	2 selected samples were tested for CEC during a salinity investigation for the site. The lowest CEC value has been used as an initial screening. The CEC value adopted is 7.4 cmolc/kg.
Clay content	10 %	Conservative value for initial screen
Traffic volumes	low	The Site is considered to be located within a low traffic area
State / Territory	New South Wales	-

**Table E4: EIL in mg/kg**

	Analyte	EIL
<b>Metals</b>	Arsenic	100
	Copper	100
	Nickel	35
	Chromium III	410
	Lead	1100
	Zinc	300
<b>PAH</b>	Naphthalene	170
<b>OCP</b>	DDT	180



### E2.3 Ecological Screening Levels

Ecological Screening Levels (ESLs) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESLs, based on a fine soil type are shown in the following Table D5.

Table D5: ESL in mg/kg

	Analyte	ESL <sup>1</sup>	Comments
TRH	C6 – C10 (less BTEX) [F1]	180*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	120*	
	>C16-C34 [F3]	1300	
	>C34-C40 [F4]	5600	
BTEX	Benzene	65	
	Toluene	105	
	Ethylbenzene	125	
	Xylenes	45	
PAH	Benzo(a)pyrene	0.7	

### E2.4 Management Limits

In addition to appropriate consideration and application of the HSLs and ESLs, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

The adopted management limits, based on a fine soil type (Section 11.1), are shown in the following Table D6.

Table D5: Management Limits in mg/kg

	Analyte	Management Limit
TRH	C <sub>6</sub> – C <sub>10</sub> (F1) #	800
	>C <sub>10</sub> -C <sub>16</sub> (F2) #	1000
	>C <sub>16</sub> -C <sub>34</sub> (F3)	3500
	>C <sub>34</sub> -C <sub>40</sub> (F4)	10 000

# Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2



## E2.5 Asbestos in Soil

NEPC (2013) defines the various asbestos types as follows:

**Bonded ACM:** Asbestos containing material which is in sound condition, bound in a matrix of cement or resin, and cannot pass a 7 mm x 7 mm sieve.

**FA:** Fibrous asbestos material including severely weathered cement sheet, insulation products and woven asbestos material. This material is typically unbonded or was previously bonded and is now significantly degraded and crumbling.

**AF:** Asbestos fines including free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

Health Screening Levels (HSLs) for asbestos in soil, which are based on likely exposure levels for different scenarios, have been adopted in NEPC (2013) from the Western Australian Department of Health (WA DoH) publication Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia 2009 (WA DoH 2009).

On the basis of the proposed land use, and in accordance with Table 7, Schedule B1, NEPC (2013) the following asbestos HSLs have been adopted:

**Table D6: Health Screening Levels for Asbestos Contamination in Soil (% w/w)**

Form of Asbestos	HSL
Bonded ACM	0.01%
FA and AF	0.001 %
All Forms of Asbestos	No visible asbestos for surface soil



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Attachment 8

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**Appendix F**

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Laboratory Certificates



12 Ashley Street, Chatswood, NSW 2067  
tel: +61 2 9910 6200

email: sydney@envirolab.com.au  
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

**CERTIFICATE OF ANALYSIS**

**170364**

**Client:**

**Douglas Partners Pty Ltd Smeaton Grange**  
18 Waler Crescent  
Smeaton Grange  
NSW 2567

**Attention:** Bradley Harris, Simon Longhurst

**Sample log in details:**

Your Reference:	<b>92228.00, DPI 182 Raby Road, Gleswood Hills, NSW</b>
No. of samples:	12 soils, 2 materials
Date samples received / completed instructions received	29/06/17 / 29/06/17

**Analysis Details:**


Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

**Report Details:**

Date results requested by: / Issue Date:	6/07/17 / 6/07/17
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.  
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with \*.**

**Results Approved By:**



\_\_\_\_\_  
David Springer  
General Manager

Envirolab Reference: 170364  
Revision No: R 00



Client Reference: 92228.00, DPI 182 Raby Road, Gleswood Hills, NSW

vTRH(C6-C10)BTEXN in Soil						
Our Reference:	UNITS	170364-1	170364-2	170364-3	170364-4	170364-5
Your Reference	-----	1	2	3	4	5
	-					
Depth	-----	0-0.1	0-0.1	0-0.05	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	105	107	100	91	109
vTRH(C6-C10)BTEXN in Soil						
Our Reference:	UNITS	170364-6	170364-7	170364-8	170364-9	170364-10
Your Reference	-----	6	7	8	BD1 280617	BD2 280617
	-					
Depth	-----	0-0.1	0-0.1	0-0.1	-	-
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	110	107	103	103	75

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vTRH(C6-C10)BTEXN in Soil			
Our Reference:	UNITS	170364-11	170364-12
Your Reference	-----	TB/280617	TS/280617
	-		
Depth	-----	-	-
Date Sampled		28/06/2017	28/06/2017
Type of sample		Soil	Soil
Date extracted	-	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017
TRHC6 - C9	mg/kg	<25	[NA]
TRHC6 - C10	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	95%
Toluene	mg/kg	<0.5	98%
Ethylbenzene	mg/kg	<1	87%
m+p-xylene	mg/kg	<2	86%
o-Xylene	mg/kg	<1	88%
Total +ve Xylenes	mg/kg	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	103	97

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svTRH(C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	170364-1 1	170364-2 2	170364-3 3	170364-4 4	170364-5 5
Depth	-----	0-0.1	0-0.1	0-0.05	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
TRHC10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg	<100	<100	<100	<100	<100
TRH>C10-C16	mg/kg	<50	<50	<50	<50	<50
TRH>C10 - C16 less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C16-C34	mg/kg	<100	<100	<100	<100	<100
TRH>C34-C40	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	94	95	93	93

svTRH(C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	170364-6 6	170364-7 7	170364-8 8	170364-9 BD1 280617	170364-10 BD2 280617
Depth	-----	0-0.1	0-0.1	0-0.1	-	-
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
TRHC10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC15 - C28	mg/kg	<100	180	<100	<100	<100
TRHC29 - C36	mg/kg	<100	210	<100	<100	<100
TRH>C10-C16	mg/kg	<50	<50	<50	<50	<50
TRH>C10 - C16 less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C16-C34	mg/kg	<100	330	<100	<100	<100
TRH>C34-C40	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	330	<50	<50	<50
Surrogate o-Terphenyl	%	99	102	94	95	93

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PAHs in Soil Our Reference: Your Reference	UNITS	170364-1	170364-2	170364-3	170364-4	170364-5
Depth	-----	1	2	3	4	5
Date Sampled	-----	0-0.1	0-0.1	0-0.05	0-0.1	0-0.1
Type of sample		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
		Soil	Soil	Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	05/07/2017	05/07/2017	05/07/2017	05/07/2017	05/07/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.3	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.1	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc (half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	2.0	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	101	94	96	98	94

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PAHs in Soil Our Reference: Your Reference	UNITS ----- -	170364-6 6	170364-7 7	170364-8 8
Depth	-----	0-0.1	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	05/07/2017	05/07/2017	05/07/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	<0.1
Pyrene	mg/kg	<0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	0.52	<0.05
Surrogate p-Terphenyl-d14	%	96	97	98

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Organochlorine Pesticides in soil	UNITS	170364-6	170364-7	170364-8
Our Reference:	-----	6	7	8
Your Reference	-			
Depth	-----	0-0.1	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	03/07/2017	03/07/2017	03/07/2017
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	92	90

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Organophosphorus Pesticides	UNITS	170364-6	170364-7	170364-8
Our Reference:	-----	6	7	8
Your Reference	-			
Depth	-----	0-0.1	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	03/07/2017	03/07/2017	03/07/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	92	92	90

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PCBs in Soil		170364-6	170364-7	170364-8
Our Reference:	UNITS	6	7	8
Your Reference	-----			
	-			
Depth	-----	0-0.1	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	03/07/2017	03/07/2017	03/07/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	92	92	90

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Acid Extractable metals in soil						
Our Reference:	UNITS	170364-1	170364-2	170364-3	170364-4	170364-5
Your Reference	-----	1	2	3	4	5
	-					
Depth	-----	0-0.1	0-0.1	0-0.05	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Arsenic	mg/kg	9	5	<4	6	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	18	16	24	18
Copper	mg/kg	27	24	37	17	19
Lead	mg/kg	15	22	30	32	120
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	8	10	9	7
Zinc	mg/kg	45	37	110	93	67
Acid Extractable metals in soil						
Our Reference:	UNITS	170364-6	170364-7	170364-8	170364-9	170364-10
Your Reference	-----	6	7	8	BD1280617	BD2280617
	-					
Depth	-----	0-0.1	0-0.1	0-0.1	-	-
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Arsenic	mg/kg	5	5	5	4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	16	17	17	20
Copper	mg/kg	24	32	26	25	18
Lead	mg/kg	82	49	31	22	19
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	10	11	9	7
Zinc	mg/kg	120	150	110	51	53

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Acid Extractable metals in soil		
Our Reference:	UNITS	170364-11
Your Reference	-----	TB/280617
	-	
Depth	-----	-
Date Sampled		28/06/2017
Type of sample		Soil
Date prepared	-	03/07/2017
Date analysed	-	03/07/2017
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	2
Copper	mg/kg	<1
Lead	mg/kg	<1
Mercury	mg/kg	<0.1
Nickel	mg/kg	<1
Zinc	mg/kg	2

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Moisture						
Our Reference:	UNITS	170364-1	170364-2	170364-3	170364-4	170364-5
Your Reference	-----	1	2	3	4	5
	-					
Depth	-----	0-0.1	0-0.1	0-0.05	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
Moisture	%	17	17	7.7	13	11

Moisture						
Our Reference:	UNITS	170364-6	170364-7	170364-8	170364-9	170364-10
Your Reference	-----	6	7	8	BD1 280617	BD2 280617
	-					
Depth	-----	0-0.1	0-0.1	0-0.1	-	-
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
Moisture	%	12	11	11	11	12

Moisture		
Our Reference:	UNITS	170364-11
Your Reference	-----	TB/280617
	-	
Depth	-----	-
Date Sampled		28/06/2017
Type of sample		Soil
Date prepared	-	03/07/2017
Date analysed	-	04/07/2017
Moisture	%	0.1

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Misc Soil - Inorg						
Our Reference:	UNITS	170364-1	170364-4	170364-5	170364-7	170364-8
Your Reference	-----	1	4	5	7	8
	-					
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	03/07/2017	03/07/2017	03/07/2017	03/07/2017	03/07/2017
Date analysed	-	04/07/2017	04/07/2017	04/07/2017	04/07/2017	04/07/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

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Asbestos ID - soils NEPM Our Reference: Your Reference	UNITS	170364-1	170364-4	170364-5	170364-7	170364-8
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		28/06/2017	28/06/2017	28/06/2017	28/06/2017	28/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	6/07/2017	6/07/2017	6/07/2017	6/07/2017	6/07/2017
Sample mass tested	g	611.21	723.45	803.18	606.15	751.52
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos <sup>TM</sup>	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	-	-	-	-	-
FA and AF Estimation*	g	-	-	-	-	-
FA and AF Estimation <sup>TM</sup>	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

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Asbestos ID - materials			
Our Reference:	UNITS	170364-13	170364-14
Your Reference	-----	F1	F2
	-		
Depth	-----	-	-
Date Sampled		28/06/2017	28/06/2017
Type of sample		Material	Material
Date analysed	-	05/07/2017	05/07/2017
Mass / Dimension of Sample	-	80x60x7mm	100x70x5mm
Sample Description	-	Grey compressed fibre cement material	Beige layered fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected	No asbestos detected Organic fibre detected

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Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.  Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.

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Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
ASB-001	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p><b>NOTE #1</b> Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM &gt;7mm, &lt;7mm and FA/AF)</p> <p><b>NOTE #2</b> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2017	170364-1	03/07/2017    03/07/2017	LCS-9	03/07/2017
Date analysed	-			04/07/2017	170364-1	04/07/2017    04/07/2017	LCS-9	04/07/2017
TRHC <sub>3</sub> - C <sub>3</sub>	mg/kg	25	Org-016	<25	170364-1	<25    <25	LCS-9	116%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	170364-1	<25    <25	LCS-9	116%
Benzene	mg/kg	0.2	Org-016	<0.2	170364-1	<0.2    <0.2	LCS-9	100%
Toluene	mg/kg	0.5	Org-016	<0.5	170364-1	<0.5    <0.5	LCS-9	108%
Ethylbenzene	mg/kg	1	Org-016	<1	170364-1	<1    <1	LCS-9	122%
m+p-xylene	mg/kg	2	Org-016	<2	170364-1	<2    <2	LCS-9	125%
o-Xylene	mg/kg	1	Org-016	<1	170364-1	<1    <1	LCS-9	122%
naphthalene	mg/kg	1	Org-014	<1	170364-1	<1    <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	120	170364-1	105    90    RPD: 15	LCS-9	102%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2017	170364-1	03/07/2017    03/07/2017	LCS-9	03/07/2017
Date analysed	-			04/07/2017	170364-1	04/07/2017    04/07/2017	LCS-9	04/07/2017
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	170364-1	<50    <50	LCS-9	104%
TRHC <sub>15</sub> - C <sub>23</sub>	mg/kg	100	Org-003	<100	170364-1	<100    <100	LCS-9	99%
TRHC <sub>29</sub> - C <sub>35</sub>	mg/kg	100	Org-003	<100	170364-1	<100    <100	LCS-9	91%
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	170364-1	<50    <50	LCS-9	104%
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	170364-1	<100    <100	LCS-9	99%
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	170364-1	<100    <100	LCS-9	91%
Surrogate o-Terphenyl	%		Org-003	94	170364-1	92    93    RPD: 1	LCS-9	96%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2017	170364-1	03/07/2017    03/07/2017	LCS-9	03/07/2017
Date analysed	-			05/07/2017	170364-1	05/07/2017    05/07/2017	LCS-9	05/07/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	LCS-9	101%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	LCS-9	98%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	LCS-9	98%
Anthracene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	LCS-9	105%
Pyrene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	LCS-9	107%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	LCS-9	110%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	170364-1	<0.2    <0.2	[NR]	[NR]

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	170364-1	<0.05    <0.05	LCS-9	79%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	170364-1	<0.1    <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	100	170364-1	101    93    RPD: 8	LCS-9	120%
QUALITY CONTROL						Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2017	[NT]	[NT]	LCS-9	03/07/2017
Date analysed	-			03/07/2017	[NT]	[NT]	LCS-9	03/07/2017
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	83%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	96%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	99%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	98%
HeptachlorEpoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	101%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	99%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	110%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	98%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	102%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-9	84%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	92	[NT]	[NT]	LCS-9	114%

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			03/07/2017	[NT]	[NT]	LCS-9	03/07/2017
Date analysed	-			03/07/2017	[NT]	[NT]	LCS-9	03/07/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	84%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	80%
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	83%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	95%
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	73%
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	115%
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-9	91%
Surrogate TCMX	%		Org-008	92	[NT]	[NT]	LCS-9	93%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2017	[NT]	[NT]	LCS-9	03/07/2017
Date analysed	-			03/07/2017	[NT]	[NT]	LCS-9	03/07/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-9	123%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-006	92	[NT]	[NT]	LCS-9	93%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date prepared	-			03/07/2017	170364-1	03/07/2017    03/07/2017	LCS-9	03/07/2017
Date analysed	-			04/07/2017	170364-1	03/07/2017    03/07/2017	LCS-9	03/07/2017
Arsenic	mg/kg	4	Metals-020	<4	170364-1	9    9    RPD: 0	LCS-9	111%
Cadmium	mg/kg	0.4	Metals-020	<0.4	170364-1	<0.4    <0.4	LCS-9	108%
Chromium	mg/kg	1	Metals-020	<1	170364-1	16    14    RPD: 13	LCS-9	111%
Copper	mg/kg	1	Metals-020	<1	170364-1	27    29    RPD: 7	LCS-9	111%
Lead	mg/kg	1	Metals-020	<1	170364-1	15    16    RPD: 6	LCS-9	106%
Mercury	mg/kg	0.1	Metals-021	<0.1	170364-1	<0.1    <0.1	LCS-9	101%
Nickel	mg/kg	1	Metals-020	<1	170364-1	12    12    RPD: 0	LCS-9	104%
Zinc	mg/kg	1	Metals-020	<1	170364-1	45    49    RPD: 9	LCS-9	105%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Soil - Inorg						Base II Duplicate II %RPD		
Date prepared	-			04/07/2017	170364-1	03/07/2017    03/07/2017	LCS-9	04/07/2017
Date analysed	-			04/07/2017	170364-1	04/07/2017    04/07/2017	LCS-9	04/07/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	170364-1	<5    <5	LCS-9	103%
QUALITY CONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
vTRH(C6-C10)BTEXN in Soil				Base + Duplicate + %RPD				
Date extracted	-	170364-6		03/07/2017    03/07/2017		170364-7	03/07/2017	
Date analysed	-	170364-6		04/07/2017    04/07/2017		170364-7	04/07/2017	
TRHC3 - C3	mg/kg	170364-6		<25    <25		170364-7	95%	
TRHC6 - C10	mg/kg	170364-6		<25    <25		170364-7	95%	
Benzene	mg/kg	170364-6		<0.2    <0.2		170364-7	80%	
Toluene	mg/kg	170364-6		<0.5    <0.5		170364-7	90%	
Ethylbenzene	mg/kg	170364-6		<1    <1		170364-7	96%	
m+p-xylene	mg/kg	170364-6		<2    <2		170364-7	105%	
o-Xylene	mg/kg	170364-6		<1    <1		170364-7	97%	
naphthalene	mg/kg	170364-6		<1    <1		[NR]	[NR]	
Surrogate aaa-Trifluorotoluene	%	170364-6		110    104    RPD: 6		170364-7	87%	

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QUALITY CONTROL svTRH(C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Date analysed	-	170364-6	04/07/2017    04/07/2017	170364-7	04/07/2017
TRHC10 - C14	mg/kg	170364-6	<50    <50	170364-7	113%
TRHC15 - C23	mg/kg	170364-6	<100    <100	170364-7	105%
TRHC29 - C35	mg/kg	170364-6	<100    <100	170364-7	96%
TRH >C10-C16	mg/kg	170364-6	<50    <50	170364-7	113%
TRH >C16-C34	mg/kg	170364-6	<100    <100	170364-7	105%
TRH >C34-C40	mg/kg	170364-6	<100    <100	170364-7	96%
Surrogate o-Terphenyl	%	170364-6	99    99    RPD: 0	170364-7	102%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Date analysed	-	170364-6	05/07/2017    05/07/2017	170364-7	05/07/2017
Naphthalene	mg/kg	170364-6	<0.1    <0.1	170364-7	100%
Acenaphthylene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Acenaphthene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Fluorene	mg/kg	170364-6	<0.1    <0.1	170364-7	97%
Phenanthrene	mg/kg	170364-6	<0.1    <0.1	170364-7	94%
Anthracene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Fluoranthene	mg/kg	170364-6	<0.1    <0.1	170364-7	100%
Pyrene	mg/kg	170364-6	<0.1    <0.1	170364-7	106%
Benzo(a)anthracene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Chrysene	mg/kg	170364-6	<0.1    <0.1	170364-7	113%
Benzo(b,j+k)fluoranthene	mg/kg	170364-6	<0.2    <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	170364-6	<0.05    <0.05	170364-7	90%
Indeno(1,2,3-c,d)pyrene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	170364-6	96    98    RPD: 2	170364-7	118%

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## Client Reference: 92228.00, DPI 182 Raby Road, Gleswood Hills, NSW

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Date analysed	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
HCB	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
alpha-BHC	mg/kg	170364-6	<0.1    <0.1	170364-7	80%
gamma-BHC	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
beta-BHC	mg/kg	170364-6	<0.1    <0.1	170364-7	96%
Heptachlor	mg/kg	170364-6	<0.1    <0.1	170364-7	101%
delta-BHC	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Aldrin	mg/kg	170364-6	<0.1    <0.1	170364-7	99%
HeptachlorEpoxide	mg/kg	170364-6	<0.1    <0.1	170364-7	102%
gamma-Chlordane	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Endosulfan I	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
pp-DDE	mg/kg	170364-6	<0.1    <0.1	170364-7	99%
Dieldrin	mg/kg	170364-6	<0.1    <0.1	170364-7	111%
Endrin	mg/kg	170364-6	<0.1    <0.1	170364-7	103%
pp-DDD	mg/kg	170364-6	<0.1    <0.1	170364-7	102%
Endosulfan II	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
pp-DDT	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	170364-6	<0.1    <0.1	170364-7	81%
Methoxychlor	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Surrogate TCMX	%	170364-6	92    92    RPD: 0	170364-7	113%

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## Client Reference: 92228.00, DPI 182 Raby Road, Gleswood Hills, NSW

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Date analysed	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Azinphos-methyl (Guthion)	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	170364-6	<0.1    <0.1	170364-7	85%
Chlorpyrifos-methyl	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Diazinon	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Dichlorvos	mg/kg	170364-6	<0.1    <0.1	170364-7	91%
Dimethoate	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Ethion	mg/kg	170364-6	<0.1    <0.1	170364-7	99%
Fenitrothion	mg/kg	170364-6	<0.1    <0.1	170364-7	95%
Malathion	mg/kg	170364-6	<0.1    <0.1	170364-7	75%
Parathion	mg/kg	170364-6	<0.1    <0.1	170364-7	114%
Ronnel	mg/kg	170364-6	<0.1    <0.1	170364-7	92%
Surrogate TCMX	%	170364-6	92    92    RPD: 0	170364-7	91%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Date analysed	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Aroclor 1016	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	170364-6	<0.1    <0.1	170364-7	115%
Aroclor 1260	mg/kg	170364-6	<0.1    <0.1	[NR]	[NR]
Surrogate TCLMX	%	170364-6	92    92    RPD: 0	170364-7	91%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	170364-6	03/07/2017    03/07/2017	170364-7	03/07/2017
Date analysed	-	170364-6	03/07/2017    03/07/2017	170364-7	04/07/2017
Arsenic	mg/kg	170364-6	5    6    RPD: 18	170364-7	93%
Cadmium	mg/kg	170364-6	<0.4    <0.4	170364-7	89%
Chromium	mg/kg	170364-6	11    16    RPD: 37	170364-7	95%
Copper	mg/kg	170364-6	24    22    RPD: 9	170364-7	102%
Lead	mg/kg	170364-6	82    110    RPD: 29	170364-7	90%
Mercury	mg/kg	170364-6	0.1    0.2    RPD: 67	170364-7	96%
Nickel	mg/kg	170364-6	8    10    RPD: 22	170364-7	88%
Zinc	mg/kg	170364-6	120    140    RPD: 15	170364-7	#

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**Report Comments:**

Acid Extractable Metals in Soil:

# Poor spike recovery was obtained for this sample. The sample was re-digested and re-spiked and the poor recovery was confirmed. This is due to matrix interferences and the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Asbestos ID was analysed by Approved Identifier: Matt Tang  
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test

NR: Test not required

<: Less than

PQL: Practical Quantitation Limit

RPD: Relative Percent Difference

>: Greater than

NT: Not tested

NA: Test not required

LCS: Laboratory Control Sample

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Client Reference: 92228.00, DPI 182 Raby Road, Gleswood Hills, NSW

#### **Quality Control Definitions**

**Blank:** This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

**Duplicate:** This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

**Matrix Spike:** A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

**LCS (Laboratory Control Sample):** This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

**Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

#### **Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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**CHAIN OF CUSTODY**

**Project Name:** DPI 182 Raby Road, Gledswood Hills, NSW  
**Project No:** 92228.00  
**Project Mgr:** BAH  
**Email:** Bradley.Harris@douglaspartners.com.au; Simon.Longhurst@douglaspartners.  
**Date Required:** Standard

**To:** Envirolab Services  
 12 Ashley Street, Chatswood NSW 2067  
**Attn:** Tania Notaras  
**Phone:** (02) 9910 6200  
**Fax:** (02) 9910 6201  
**Email:** tnotaras@envirolabservices.com.au

**Sampler:** SJL/LOC  
**Mob. Phone:** 0412 754 162

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes							Notes/preservation			
			S - soil	W - water		8 Heavy Metals	OCP/OP	PCB	TRH and BTEX	PAH	Total Phenols	Asbestos (500ml)				
1/0-0.1	1	28/06/17	S	G & P	G - glass	X			X	X						
2/0-0.1	2	28/06/17	S	G & P	G - glass	X			X	X						
3/0-0.05	3	28/06/17	S	G & P	G - glass	X			X	X						
4/0-0.1	4	28/06/17	S	G & P	G - glass	X			X	X						
5/0-0.1	5	28/06/17	S	G & P	G - glass	X			X	X						
6/0-0.1	6	28/06/17	S	G & P	G - glass	X		X	X	X						
7/0-0.1	7	28/06/17	S	G & P	G - glass	X		X	X	X						
8/0-0.1	8	28/06/17	S	G & P	G - glass	X		X	X	X						
BD1 280617	9	28/06/17	S	G	G	X			X	X						
BD2 280617	10	28/06/17	S	G	G	X			X	X						
TB/280617	11	28/06/17	S	G	G	X			X	X						
TS/280617	12	28/06/17	S	G	G	X			X	X						

**Lab Report No:** \_\_\_\_\_  
**Send Results to:** Douglas Partners Pty Ltd  
 Address 18 Water Crescent Smeaton Grange  
 Phone: (02) 4647 0075 Fax: (02) 4646 1886  
**Relinquished by:** LOC/SJL  
 Date & Time: 15.02.2017  
**Signed:** *[Signature]* Received by: *James - GLS*





Envirolab Services Pty Ltd  
 ABN 37 112 535 645  
 12 Ashley St Chatswood NSW 2067  
 ph 02 9910 6200 fax 02 9910 6201  
 customerservice@envirolab.com.au  
 www.envirolab.com.au

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### CERTIFICATE OF ANALYSIS 175552

#### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

#### Sample Details

<b>Your Reference</b>	<b>92228.00, Soil Investigation</b>
<b>Number of Samples</b>	7 Soils, 4 Materials
<b>Date samples received</b>	13/09/2017
<b>Date completed instructions received</b>	13/09/2017

#### Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.  
 Samples were analysed as received from the client. Results relate specifically to the samples as received.  
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

#### Report Details

<b>Date results requested by</b>	20/09/2017
<b>Date of Issue</b>	20/09/2017
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### Report Comments

Asbestos-ID in soil: NEPM  
 This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.  
 This is reported outside our scope of NATA accreditation.

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Paul Ching, Lucy Zhu  
 Authorised by Asbestos Approved Signatory: Paul Ching

#### Results Approved By

Giovanni Agosti, Group Technical Manager  
 Jeremy Faircloth, Organics Supervisor  
 Paul Ching, Senior Analyst

#### Authorised By

David Springer, General Manager

Envirolab Reference: 175552  
 Revision No: R00



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## Client Reference: 92228.00, Soil Investigation

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		175552-10
Your Reference	UNITS	Stockpile (S1)
Date Sampled		13/09/2017
Type of sample		Soil
Date extracted	-	14/09/2017
Date analysed	-	15/09/2017
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25
vTPH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	101

## Client Reference: 92228.00, Soil Investigation

svTRH (C10-C40) in Soil		
Our Reference		175552-10
Your Reference	UNITS	Stockpile (S1)
Date Sampled		13/09/2017
Type of sample		Soil
Date extracted	-	14/09/2017
Date analysed	-	15/09/2017
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	140
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	120
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100
Total +ve TRH (>C <sub>10</sub> -C <sub>40</sub> )	mg/kg	120
Surrogate o-Terphenyl	%	101

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## Client Reference: 92228.00, Soil Investigation

PAHs in Soil		
Our Reference		175552-10
Your Reference	UNITS	Stockpile (S1)
Date Sampled		13/09/2017
Type of sample		Soil
Date extracted	-	14/09/2017
Date analysed	-	15/09/2017
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total +ve PAH's	mg/kg	0.05
Surrogate p-Terphenyl-d14	%	86

## Client Reference: 92228.00, Soil Investigation

Organochlorine Pesticides in soil		
Our Reference		175552-10
Your Reference	UNITS	Stockpile (S1)
Date Sampled		13/09/2017
Type of sample		Soil
Date extracted	-	14/09/2017
Date analysed	-	15/09/2017
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	107

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**Client Reference: 92228.00, Soil Investigation**

Acid Extractable metals in soil		
Our Reference		175552-10
Your Reference	UNITS	Stockpile (S1)
Date Sampled		13/09/2017
Type of sample		Soil
Date prepared	-	14/09/2017
Date analysed	-	14/09/2017
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	13
Copper	mg/kg	26
Lead	mg/kg	56
Mercury	mg/kg	<0.1
Nickel	mg/kg	9
Zinc	mg/kg	240

**Client Reference: 92228.00, Soil Investigation**

Moisture		
Our Reference		175552-10
Your Reference	UNITS	Stockpile (S1)
Date Sampled		13/09/2017
Type of sample		Soil
Date prepared	-	14/09/2017
Date analysed	-	15/09/2017
Moisture	%	1.9

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## Client Reference: 92228.00, Soil Investigation

Asbestos ID - soils NEPM - ASB-001						
Our Reference		175552-1	175552-2	175552-3	175552-4	175552-5
Your Reference	UNITS	SS1-F1	SS2-F1N	SS3-F1E	SS4-F1S	SS5-F1W
Date Sampled		13/09/2017	13/09/2017	13/09/2017	13/09/2017	13/09/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	19/09/2017	19/09/2017	19/09/2017	19/09/2017	19/09/2017
Sample mass tested	g	768.92	709.04	853.72	960.76	721.94
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	-	-	-	-	-
FA and AF Estimation*	g	-	-	-	-	-
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

## Client Reference: 92228.00, Soil Investigation

Asbestos ID - materials					
Our Reference		175552-6	175552-7	175552-8	175552-9
Your Reference	UNITS	F3	F4	F5	F6
Date Sampled		13/09/2017	13/09/2017	13/09/2017	13/09/2017
Type of sample		Material	Material	Material	Material
Date analysed	-	19/09/2017	19/09/2017	19/09/2017	19/09/2017
Mass / Dimension of Sample	-	55x29x5mm	85x85x5mm	30x30x5mm	48x27x2mm
Sample Description	-	Beige fibre cement material	Beige fibre cement material	Beige fibre cement material	Grey fibre cement material
Asbestos ID in materials	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
		Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected

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Attachment 8

## Client Reference: 92228.00, Soil Investigation

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p><b>NOTE #1</b> Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM &gt;7mm, &lt;7mm and FA/AF)</p> <p><b>NOTE #2</b> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "-" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	<p>Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.</p> <p>F2 = (&gt;C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.</p> <p>Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (&gt;C10-C40).</p>
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

## Client Reference: 92228.00, Soil Investigation

Method ID	Methodology Summary
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

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Attachment 8



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Attachment 8

## Client Reference: 92228.00, Soil Investigation

QUALITY CONTROL: vTRH(C6-C10)BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
Date analysed	-			15/09/2017	[NT]	[NT]	[NT]	[NT]	15/09/2017	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-018	<25	[NT]	[NT]	[NT]	[NT]	125	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-018	<25	[NT]	[NT]	[NT]	[NT]	125	[NT]
Benzene	mg/kg	0.2	Org-018	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Toluene	mg/kg	0.5	Org-018	<0.5	[NT]	[NT]	[NT]	[NT]	117	[NT]
Ethylbenzene	mg/kg	1	Org-018	<1	[NT]	[NT]	[NT]	[NT]	130	[NT]
m+p-xylene	mg/kg	2	Org-018	<2	[NT]	[NT]	[NT]	[NT]	132	[NT]
o-Xylene	mg/kg	1	Org-018	<1	[NT]	[NT]	[NT]	[NT]	128	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-018	115	[NT]	[NT]	[NT]	[NT]	124	[NT]

## Client Reference: 92228.00, Soil Investigation

QUALITY CONTROL: svTRH (C10-C40) in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
Date analysed	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C <sub>29</sub> - C <sub>38</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate o-Terphenyl	%		Org-003	83	[NT]	[NT]	[NT]	[NT]	100	[NT]

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## Client Reference: 92228.00, Soil Investigation

QUALITY CONTROL: PAHs in Soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
Date analysed	-			15/09/2017	[NT]	[NT]	[NT]	[NT]	15/09/2017	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate <i>p</i> -Terphenyl-d14	%		Org-012	87	[NT]	[NT]	[NT]	[NT]	85	[NT]

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## Client Reference: 92228.00, Soil Investigation

QUALITY CONTROL: Organochlorine Pesticides in soil				Duplicate				Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
Date analysed	-			15/09/2017	[NT]	[NT]	[NT]	[NT]	15/09/2017	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	113	[NT]	[NT]	[NT]	[NT]	122	[NT]

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## Client Reference: 92228.00, Soil Investigation

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
Date analysed	-			14/09/2017	[NT]	[NT]	[NT]	[NT]	14/09/2017	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	110	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]

## Client Reference: 92228.00, Soil Investigation

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Result Definitions	
<b>NT</b>	Not tested
<b>NA</b>	Test not required
<b>INS</b>	Insufficient sample for this test
<b>PQL</b>	Practical Quantitation Limit
<b>&lt;</b>	Less than
<b>&gt;</b>	Greater than
<b>RPD</b>	Relative Percent Difference
<b>LCS</b>	Laboratory Control Sample
<b>NS</b>	Not specified
<b>NEPM</b>	National Environmental Protection Measure
<b>NR</b>	Not Reported

Quality Control Definitions	
<b>Blank</b>	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
<b>Duplicate</b>	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
<b>Matrix Spike</b>	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
<b>LCS (Laboratory Control Sample)</b>	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
<b>Surrogate Spike</b>	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1 cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Attachment 8

**Client Reference: 92228.00, Soil Investigation****Laboratory Acceptance Criteria**

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.



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ORD01

### CERTIFICATE OF ANALYSIS 175552-A

#### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

#### Sample Details

<b>Your Reference</b>	<b>92228.00, Soil Investigation</b>
<b>Number of Samples</b>	Additional Testing on 1 Soil
<b>Date samples received</b>	13/09/2017
<b>Date completed instructions received</b>	20/09/2017

#### Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.  
 Samples were analysed as received from the client. Results relate specifically to the samples as received.  
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

#### Report Details

<b>Date results requested by</b>	27/09/2017
<b>Date of Issue</b>	27/09/2017
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### Report Comments

Asbestos-ID in soil: NEPM  
 This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.  
 This is reported outside our scope of NATA accreditation.

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Paul Ching  
 Authorised by Asbestos Approved Signatory: Paul Ching  
**Results Approved By**  
 Paul Ching, Senior Analyst

#### Authorised By

David Springer, General Manager

Envirolab Reference: 175552-A  
 Revision No: R00



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## Client Reference: 92228.00, Soil Investigation

Asbestos ID - soils NEPM		
Our Reference		175552-A-11
Your Reference	UNITS	S1
Date Sampled		13/09/2017
Type of sample		Soil
Date analysed	-	27/09/2017
Sample mass tested	g	575.6
Sample Description	-	Brown soil, rocks & organic debris
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg  Organic fibre detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	-
FA and AF Estimation*	g	-
FA and AF Estimation*#2	%(w/w)	<0.001

## Client Reference: 92228.00, Soil Investigation

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	<p>Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004.</p> <p>Results reported denoted with * are outside our scope of NATA accreditation.</p> <p><b>NOTE #1</b> Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM &gt;7mm, &lt;7mm and FA/AF)</p> <p><b>NOTE #2</b> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.</p> <p>Estimation = Estimated asbestos weight</p> <p>Results reported with "-" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.</p>

ORD01

Attachment 8

## Client Reference: 92228.00, Soil Investigation

Result Definitions	
<b>NT</b>	Not tested
<b>NA</b>	Test not required
<b>INS</b>	Insufficient sample for this test
<b>PQL</b>	Practical Quantitation Limit
<	Less than
>	Greater than
<b>RPD</b>	Relative Percent Difference
<b>LCS</b>	Laboratory Control Sample
<b>NS</b>	Not specified
<b>NEPM</b>	National Environmental Protection Measure
<b>NR</b>	Not Reported



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ORD01

### SAMPLE RECEIPT ADVICE

Client Details	
<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell

Sample Login Details	
<b>Your reference</b>	92228.00, Soil Investigation
<b>Envirolab Reference</b>	175552-A
<b>Date Sample Received</b>	13/09/2017
<b>Date Instructions Received</b>	20/09/2017
<b>Date Results Expected to be Reported</b>	27/09/2017

Sample Condition	
<b>Samples received in appropriate condition for analysis</b>	YES
<b>No. of Samples Provided</b>	Additional Testing on 1 Soil
<b>Turnaround Time Requested</b>	Standard
<b>Temperature on Receipt (°C)</b>	21.4
<b>Cooling Method</b>	Ice Pack
<b>Sampling Date Provided</b>	YES

Comments
Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
<b>Phone:</b> 02 9910 6200	<b>Phone:</b> 02 9910 6200
<b>Fax:</b> 02 9910 6201	<b>Fax:</b> 02 9910 6201
<b>Email:</b> ahie@envirolab.com.au	<b>Email:</b> jhurst@envirolab.com.au

*Analysis Underway, details on the following page:*

Attachment 8



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Sample ID	Asbestos ID - soils NEPM	On Hold
SS1-F1		✓
SS2-F1N		✓
SS3-F1E		✓
SS4-F1S		✓
SS5-F1W		✓
F3		✓
F4		✓
F5		✓
F6		✓
Stockpile (S1)		✓
S1	✓	

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

#### Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.



**CHAIN OF CUSTODY**

<b>Project Name:</b> Soil Investigation and Waste Classification	<b>To:</b> Envirolab Services
<b>Project No:</b> 92228.00	12 Ashley Street, Chatswood NSW 2067
<b>Project Mgr:</b> Grant Russell	<b>Attn:</b> Tania Notaras
<b>Email:</b> Lachlan.Clement@Douglaspartners.com.au; Grant.Russell@douglaspartners.com.au	<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201
<b>Date Required:</b> Standard	<b>Email:</b> tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes						Notes/preservation		
					Asbestos (500ml)	Asbestos ID	PAH	OCP	Metals	BTEX		TRH	HOLD
SS1-F1	1	13/09/17	S - Soil	P - Plastic	x								
SS2-F1N	2	13/09/17	S	P	x								
SS3-F1E	3	13/09/17	S	P	x								
SS4-F1S	4	13/09/17	S	P	x								
SS5-F1W	5	13/09/17	S	P	x								
F3	6	13/09/17	F	P		X							
F4	7	13/09/17	F	P		X							
F5	8	13/09/17	F	P		X							
F6	9	13/09/17	F	P		X							
Stockpile (S1)	10	13/09/17	S	G			X						
S1	11	13/09/17	S	P								X	500ml Plastic Bag

<b>Lab Report No:</b>	
<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Address:</b> 18 Water Crescent, Smeaton Grange 2567
<b>Relinquished by:</b> LQC	<b>Phone:</b> (02) 4647 0075 <b>Fax:</b> (02) 4646 1886
<b>Signed:</b> [Signature]	<b>Date &amp; Time:</b> 13/09/2017
	<b>Transported to laboratory by:</b> [Signature]
	<b>Received by:</b> [Signature] 13/9/17 14.20

Form COC



**Envirolab Services Pty Ltd**  
 ABN 37 112 535 645  
 12 Ashley St Chatswood NSW 2067  
 ph 02 9910 6200 fax 02 9910 6201  
 customerservice@envirolab.com.au  
 www.envirolab.com.au

### SAMPLE RECEIPT ADVICE

Client Details	
<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Grant Russell

Sample Login Details	
<b>Your reference</b>	92228.00, Soil Investigation
<b>Envirolab Reference</b>	175552
<b>Date Sample Received</b>	13/09/2017
<b>Date Instructions Received</b>	13/09/2017
<b>Date Results Expected to be Reported</b>	20/09/2017

Sample Condition	
<b>Samples received in appropriate condition for analysis</b>	YES
<b>No. of Samples Provided</b>	7 Soils, 4 Materials
<b>Turnaround Time Requested</b>	Standard
<b>Temperature on Receipt (°C)</b>	21.4
<b>Cooling Method</b>	Ice Pack
<b>Sampling Date Provided</b>	YES

Comments	
Nil	

Please direct any queries to:

Aileen Hie	Jacinta Hurst
<b>Phone: 02 9910 6200</b>	<b>Phone: 02 9910 6200</b>
<b>Fax: 02 9910 6201</b>	<b>Fax: 02 9910 6201</b>
<b>Email: ahie@envirolab.com.au</b>	<b>Email: jhurst@envirolab.com.au</b>

*Analysis Underway, details on the following page:*



**EnviroLab Services Pty Ltd**  
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ORD01

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	On Hold
SS1-F1						✓		
SS2-F1N						✓		
SS3-F1E						✓		
SS4-F1S						✓		
SS5-F1W						✓		
F3							✓	
F4							✓	
F5							✓	
F6							✓	
Stockpile (S1)	✓	✓	✓	✓	✓			
S1								✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

**Additional Info**

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.  
 Requests for longer term sample storage must be received in writing.

Attachment 8



ORD01

Attachment 8

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**Appendix G**

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Test Pit Logs



# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciuneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 295956  
**NORTHING:** 6234168

**PIT No:** 1  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

ORD01

Attachment 8

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
			Type	Depth	Sample	Results & Comments		5	10	15	20
0.3	FILLING - red and grey silty clay and clayey silt with some siltstone gravel  SILTY CLAY - red silty clay, MC<PL  - becoming red mottled grey below 0.6m		D	0.0							
			D	0.1							
1	- becoming red mottled grey below 0.6m  - becoming grey mottled red with ironstone gravel below 1.2m		D	0.4							
			D	0.5							
2	- becoming grey mottled red with ironstone gravel below 1.2m		D	1.0							
			D	1.5							
2.1	SILTSTONE - extremely low strength, extremely weathered, dark brown siltstone with some ironstone banding  - becoming very low to low strength, highly to moderately weathered below 2.4m		D	2.0							
			D	2.5							
3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0							

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:**

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	w	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		gp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciuneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 295990  
**NORTHING:** 6234157

**PIT No:** 2  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)				
			Type	Depth	Sample	Results & Comments		5	10	15	20	
0.05	TOPSOIL - dark brown clayey silt with rootlets	[Graphic Log: Diagonal hatching]	D	0.0								
0.1	CLAYEY SILT - dark brown clayey silt with a trace of rootlets											
0.2	SILTY CLAY - red silty clay, MC<PL											
0.4			D									
0.5												
	- becoming red mottled brown and grey below 0.7m											
0.9	Pit discontinued at 0.9m - limit of investigation											
1												
2												
3												

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		gp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciueneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 296022  
**NORTHING:** 6234175

**PIT No:** 3  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

ORD01

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per mm)											
			Type	Depth	Sample		Results & Comments	5	10	15	20							
0.05	FILLING - red silt with basaltic gravel	XXXX	D	0.05														
	SILTY CLAY - red silty clay, MC<PL																	
	- with a trace of siltstone gravel below 0.5m		D	0.4														
			D	0.5														
1	- becoming red mottled grey with ironstone gravel below 1.0m		D	1.0														
			D	1.5														
1.8	SILTSTONE - extremely low to very low strength, extremely to moderately weathered, grey siltstone with ironstone banding		D	2.0														
2			D	2.0														
2.4	- becoming low strength, moderately weathered, dark brown below 2.3m		D	2.4														
	Pit discontinued at 2.4m - practical refusal on low strength siltstone																	
3																		

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	w	Water seep
E	Environmental sample	⚡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (50) (MPa)
		PL(D)	Point load diametral test (50) (MPa)
		gp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



Attachment 8

ORD01

Attachment 8

# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciueneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 296018  
**NORTHING:** 6234209

**PIT No:** 4  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
			Type	Depth	Sample	Results & Comments		5	10	15	20
0.2	FILLING - dark brown clayey silt with a trace of basaltic gravel and tiles	[Cross-hatched pattern]	D*	0.0							
	SILTY CLAY - red brown silty clay, MC<PL			0.01							
0.9	- becoming mottled grey below 0.6m	[Diagonal lines pattern]		0.4							
			D	0.5							
1.0	SILTSTONE - very low to low strength, highly to moderately weathered, grey brown siltstone with a trace of ironstone banding Pit discontinued at 1.0m - limit of investigation	[Dotted pattern]									

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD2/280617 collected; No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test (s/50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test (s/50) (MPa)
C	Core drilling	W	Water sample	gp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciueneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 296028  
**NORTHING:** 6234208

**PIT No:** 5  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

ORD01

Attachment 8

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)					
			Type	Depth	Sample	Results & Comments		5	10	15	20		
0.0 - 0.1	FILLING - brown clayey silt with basaltic gravel	[Cross-hatched pattern]	D'	0.0 - 0.1									
0.2 - 0.5	SILTY CLAY - red silty clay with a trace of tree roots, MC<PL	[Diagonal lines pattern]	D	0.2 - 0.5									
0.8 - 1.0	- becoming mottled grey and brown below 0.8m	[Diagonal lines pattern]	D	1.0									
1.5 - 2.0	- becoming grey with ironstone gravel below 1.8m	[Diagonal lines pattern]	D	1.5 - 2.0									
2.6 - 2.8	SILTSTONE - very low to low strength, highly to moderately weathered, brown and red siltstone with ironstone banding	[Dotted pattern]	D	2.6 - 2.8									
2.8 - 3.0	Pit discontinued at 2.8m - practical refusal on low strength siltstone	[Dotted pattern]	D	2.8									

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD3/280617 collected; No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)
C Core drilling	W Water sample	gp Pocket penetrometer (kPa)
D Disturbed sample	w Water seep	S Standard penetration test
E Environmental sample	W Water level	V Shear vane (kPa)



ORD01

Attachment 8

### TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciueneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 296002  
**NORTHING:** 6234207

**PIT No:** 6  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
			Type	Depth	Sample	Results & Comments		5	10	15	20
0.2	FILLING - dark brown clayey silt with a trace of siltstone cobbles	[Cross-hatched pattern]	D	0.0							
				0.1							
	SILTY CLAY - red brown mottled grey silty clay, MC<PL	[Diagonal lines pattern]		0.4							
			D	0.5							
1	- becoming mottled grey with siltstone and ironstone gravel below 0.9m	[Diagonal lines pattern]									
1.1	Pit discontinued at 1.1m - limit of investigation										
2											
3											

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		gp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciuneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 296002  
**NORTHING:** 6234191

**PIT No:** 7  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

ORD01

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per mm)								
			Type	Depth	Sample		Results & Comments	5	10	15	20				
0.1	FILLING - brown and red clayey silt with a trace of concrete and wood SILTY CLAY - red brown silty clay, MC<PL  - becoming mottled brown and grey below 0.6m		D	0.0 0.1  0.4 0.5											
1.0	Pit discontinued at 1.0m - limit of investigation														
2.0															
3.0															

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)
C Core drilling	W Water sample	gp Pocket penetrometer (kPa)
D Disturbed sample	w Water seep	S Standard penetration test
E Environmental sample	⚡ Water level	V Shear vane (kPa)



Attachment 8



ORD01

Attachment 8

# TEST PIT LOG

**CLIENT:** Vince and Elizabeth Pisciueneri  
**PROJECT:** Proposed Residential Subdivision  
**LOCATION:** 182 Raby Road, Gledswood Hills, NSW

**SURFACE LEVEL:** -  
**EASTING:** 295999  
**NORTHING:** 6234180

**PIT No:** 8  
**PROJECT No:** 92228.00  
**DATE:** 28/6/2017  
**SHEET 1 OF 1**

Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing			Water	Dynamic Penetrometer Test (blows per mm)			
			Type	Depth	Sample		Results & Comments	5	10	15
0.3	FILLING - brown and red clayey silt and silty clay with a trace of concrete		Df	0.0						
				0.1						
	SILTY CLAY - red mottled silty clay, MC<PL			0.4						
			D	0.5						
1.0	SILTSTONE - very low to low strength, highly to moderately weathered, grey siltstone with some ironstone banding Pit discontinued at 1.0m - limit of investigation									

**RIG:** John Deere 315SE backhoe - 450mm bucket

**LOGGED:** LOC

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD1/280617 collected; No odour/staining noted

- Sand Penetrometer AS1289.6.3.3
- Cone Penetrometer AS1289.6.3.2

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test (s/50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test (s/50) (MPa)
C	Core drilling	W	Water sample	gp	Pocket penetrometer (kPa)
D	Disturbed sample	≻	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)



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**Appendix H**

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QA/QC



## Appendix H Data Quality Assurance and Quality Control Assessment

### H1 Data Quality Indicators

Field and laboratory procedures were assessed against the following data quality indicators (DQIs):

**Table H1: Data Quality Indicators**

DQI	Performance Indicator	Acceptable Range
<b>Precision</b>		
Field considerations	SOPs appropriate and complied with	Field staff follow SOPs in the DP <i>Field Procedures Manual</i>
	field replicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%
Laboratory considerations	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%
	laboratory-prepared volatile trip spikes	Recovery of 60-140%
<b>Accuracy (bias)</b>		
Field considerations	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
Laboratory considerations	Analysis of:	
	laboratory-prepared volatile trip spikes	Recovery of 60-140%
	Laboratory-prepared trip blanks (field blanks)	<PQL
	method blanks (laboratory blanks)	Recovery of 60-140%
	matrix spikes	Recovery of 70-130% (inorganics); 60-140% (organics)
	matrix spike duplicates	Recovery of 70-130% (inorganics); 60-140% (organics); Recovery 70 "low" to 130% "high" indicates interference
	surrogate spikes	Recovery of 70-130% (inorganics); 60-140% (organics)
	laboratory control samples	Recovery of 70-130% (inorganics); 60-140% (organics)
<b>Completeness</b>		
Field considerations	All critical locations sampled	All critical locations sampled in accordance with the DQO's (Appendix D)
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
	Experienced sampler	Experienced DP Environmental Engineer to conduct field work and sampling
	Documentation correct	Maintain COC documentation at all times
	Sample holding times complied with	Sample holding times complied with

DQI	Performance Indicator	Acceptable Range
Laboratory considerations	All critical samples analysed according to DQO's	All critical locations analysed in accordance with the DQO's
	Appropriate methods and PQLs	Appropriate methods and PQLs have been used by the contract laboratory
	Sample documentation complete	Maintain COC documentation at all times
Comparability		
Field considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling
	Same types of samples collected	Same types of samples collected
Laboratory considerations	Sample analytical methods used (including clean-up)	Methods to be NATA accredited
	Sample PQLs (justify/quantify if different)	Consistent PQLs to be used
	Same laboratories (justify/quantify if different)	Same analytical laboratory for primary samples to be used
Representativeness		
Field considerations	Appropriate media sampled according to DQO's (Appendix D)	Appropriate media sampled according to DQO's (Appendix D)
	All media identified in DQO's sampled	All media identified in DQO's sampled
Laboratory considerations	All samples analysed according to DQO's	All samples analysed according to DQO's

Notes to Table 1:      SOP – Standard Operating Procedure  
                               DQO – Data Quality Objectives (Appendix D)

## H2 Field Quality Assurance and Quality Control

The field QC procedures for sampling as prescribed in the standard operating procedures (SOPs) in the Douglas Partners *Field Procedures Manual* were followed at all times during the assessment. All sample locations and media were in accordance with the DQO (i.e. as per scope of work in DP's proposal).

### H2.1 Sampling Team

Sampling was undertaken by an experienced DP Environmental Scientist.

### H2.2 Sample Collection and Weather Conditions

Sample collection procedures and dispatch are reported in body of the report. Sampling was undertaken during sunny and hot conditions.



### H2.3 Logs

Logs for each soil sampling location were recorded in the field. The individual samples were recorded on the field logs along with the sample identity, location, depth, initials of sampler, duplicate locations, duplicate type and site observations. Logs are presented in Appendix E.

### H2.4 Chain-of-Custody

Chain-of-Custody information was recorded on the Chain-of-Custody (COC) sheets and accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix F, prior to the laboratory certificates.

### H2.5 Sample Splitting Techniques

Replicate samples were collected in the field as a measure of precision of the results. Field replicates samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the primary sample were placed into the sampling jars and sealed. The sample was not homogenised in a bowl to prevent the loss of volatiles from the soil. Replicate samples were labelled with a DP identification number, recorded on DP logs, so as to conceal their relationship to their primary sample from the analysing laboratory.

### H2.6 Duplicate Frequency

Field sampling comprised intra-laboratory duplicate sampling, at a rate of approximately one duplicate sample for every ten primary samples.

### H2.7 Relative Percentage Difference

A measure of the consistency of results for field samples is derived by the calculation of relative percentage differences (RPDs) for duplicate samples. RPDs have only been considered where a concentration is greater than five times the practical quantitation limit (PQL).

#### H2.7.1 Intra-Laboratory Replicate Analysis

Replicates were tested to assess data 'precision' and the reproducibility within the primary laboratory (Envirolab Pty Ltd) as a measure of consistency of sampling techniques. One replicate sample was analysed. The Relative Percent Difference (RPD) between replicate results is used as a measure of laboratory reproducibility and is given by the following:

$$RPD = \frac{(\text{Replicate result 1} - \text{Replicate result 2})}{(\text{Replicate result 1} + \text{Replicate result 2})/2} \times 100$$

The RPD can have a value between 0% and 200%. An RPD data quality objective of up to 30% is considered to be within the acceptable range.

The comparative results of analysis between primary and duplicate samples are summarised in the table below. Where one or both results were below the PQL, an RPD was not calculated.

**Table H2: RPD Results**

Sample	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
TP8/0.0-0.1	5	<0.4	17	26	31	<0.1	11	110
BD1/280617	4	<0.4	17	25	22	<0.1	9	51
Difference	1	-	0	1	9	-	2	59
RPD (%)	22.2	-	0	3.9	<b>33.9</b>	-	20	<b>73.3</b>

Sample	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
TP5/0.0-0.1	5	<0.4	18	19	120	<0.1	7	67
BD3/280617	5	<0.4	20	18	19	<0.1	7	53
Difference	0	-	2	1	101	-	0	14
RPD (%)	0	-	10.5	5.4	<b>145.3</b>	-	0	23.3

Notes: Bold RPD >30  
 Concentration of either paired duplicated not greater than five times PQL

All RPD values were within the acceptable range of  $\pm 30$  with the exception of:

- Lead and zinc in laboratory duplicate pair TP8 and BD1; and
- Lead in laboratory duplicate pair TP5 and BD3.

The exceedances are considered likely due to the heterogeneity of the soil and are not considered to affect the results of the investigation.

Overall, the intra-laboratory and inter-laboratory comparisons indicate that the sampling technique was consistent and repeatable and therefore acceptable precision was achieved.

### H3 Laboratory Quality Assurance and Quality Control

EnviroLab Services was used as the primary laboratory. Appropriate methods and PQLs were used by the laboratory. Sample methods were NATA accredited (noting the exception for fibrous asbestos (FA) and asbestos fines (AF) quantification to 0.001% w/w).

#### H3.1 Surrogate Spike

This sample is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis to each sample. The recovery result indicates the proportion of the known concentration of the surrogate that is detected during analysis and is used to assess data 'accuracy'. Results within acceptance limits indicate that the extraction technique was effective.



### H3.2 Reference and Daily Check Sample Results – Laboratory Control Sample (LCS)

This sample comprises spiking either a standard reference material or a control matrix (such as a blank of sand or water) with a known concentration of specific analytes. The LCS is then analysed and results compared against each other to determine how the laboratory has performed with regard to sample preparation and analytical procedure and is used to assess data 'accuracy'. LCSs are analysed at a frequency of one in 20, with a minimum of one analysed per batch.

### H3.3 Laboratory Duplicate Results

These are additional portions of a sample which are analysed in exactly the same manner as all other samples and is used to assess data 'precision'. The laboratory acceptance criteria for duplicate samples is: in cases where the level is <5Xpql - any RPD is acceptable; and in cases where the level is >5xPQL - 0-50% RPD is acceptable.

### H3.4 Laboratory Blank Results

The laboratory blank, sometimes referred to as the method blank or reagent blank is the sample prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus and is used to assess data 'accuracy'. This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, it can be determined by processing solvents and reagents in exactly the same manner as for samples. Laboratory blanks are analysed at a frequency of 1 in 20, with a minimum of one per batch.

### H3.5 Matrix Spike

This is a sample duplicate prepared by adding a known amount of analyte prior to analysis, and then treated exactly the same as all other samples. The recovery result indicates the proportion of the known concentration of the analyte that is detected during analysis and is used to assess data 'accuracy'. The laboratory acceptance criteria for matrix spike samples are generally 70 - 130% for inorganic/metals; and 60 - 140% for organics; and 10 - 140% for SVOC and speciated phenols.

### H3.6 Results of Laboratory QC

The laboratory QC for surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spikes results are reported in the laboratory certificate of analysis.

The laboratory quality control samples were within the laboratory acceptance criteria. It is considered that an acceptable level of laboratory precision and accuracy was achieved and that surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spike results were of an acceptable level overall. On the basis of this assessment, the laboratory data set is considered to have complied with the DQIs.

### H3.7 Overall Assessment of QA/QC

Specific limits associated with sample handling and laboratory QA/QC were assessed against the DQIs and a summary of compliance is presented in the following table.

**Table H5: Data Quality Indicators**

DQI	Performance Indicator	Acceptable Range	Compliance
<b>Precision</b>			
Field considerations	SOPs appropriate and complied with	Field staff follow SOPs in the DP <i>Field Procedures Manual</i>	C
	field replicates	Precision average relative percent difference (RPD) result <5 times PQL, no limit; results >5 times PQL, 0% - 30%	C
Laboratory considerations	laboratory duplicates	Precision average RPD result <5 times PQL, no limit; results >5 times PQL, 0% - 50%	C
	laboratory-prepared volatile trip spikes	Recovery of 60-140%	C
<b>Accuracy (bias)</b>			
Field considerations	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>	C
Laboratory considerations	Analysis of:		
	laboratory-prepared volatile trip spikes	Recovery of 60-140%	C
	laboratory-prepared trip blanks (field blanks)	<PQL	C
	method blanks (laboratory blanks)	Recovery of 60-140%	C
	matrix spikes	Recovery of 70-130% (inorganics); 60-140% (organics)	C
	matrix spike duplicates	Recovery of 70-130% (inorganics); 60-140% (organics); Recovery 70 "low" to 130% "high" indicates interference	C
	surrogate spikes	Recovery of 70-130% (inorganics); 60-140% (organics)	C
	laboratory control samples	Recovery of 70-130% (inorganics); 60-140% (organics)	C
<b>Completeness</b>			
Field considerations	All critical locations sampled	All critical locations sampled in accordance with the SAQP	C
	SOPs appropriate and complied with	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>	C
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling	C
	Documentation correct	Maintain COC documentation at all times	C
	Sample holding times complied with	Sample holding times complied with	C



DQI	Performance Indicator	Acceptable Range	Compliance
Laboratory considerations	All critical samples analysed according to SAQP	All critical locations analysed in accordance with the SAQP	C
	Appropriate methods and PQLs	Appropriate methods and PQLs have been used by the contract laboratory	C
	Sample documentation complete	Maintain COC documentation at all times	C
Comparability			
Field considerations	Same SOPs used on each occasion	Field staff to follow SOPs in the DP <i>Field Procedures Manual</i>	C
	Experienced sampler	Experienced DP Environmental Scientist/Engineer to conduct field work and sampling	C
	Same types of samples collected (filtered)	Field filtering for metals	NA
Laboratory considerations	Sample analytical methods used (including clean-up)	Methods to be NATA accredited	C
	Sample PQLs (justify/quantify if different)	Consistent PQLs to be used	C
	Same laboratories (justify/quantify if different)	Same analytical laboratory for primary samples to be used	C
Representativeness			
Field considerations	Appropriate media sampled according to DQOs	Appropriate media sampled according to DQOs	C
	All media identified in DQOs sampled	All media identified in DQOs sampled	C
Laboratory considerations	All samples analysed according to DQOs	All samples analysed according to DQOs	C

Notes to Table 5:

- C – Compliance
- PC – Partial Compliance
- NC – Non-Compliance
- NA – Not Applicable
- SOP – Standard Operating Procedure
- DQO – Data Quality Objectives

A review of the adopted QA/QC procedures and results indicates that the DQIs have generally been met with compliance and a minor partial-compliance. On this basis, the sampling and laboratory methods used during the investigation were found to meet DQOs for this project.

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**Appendix I**

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About This Report

# About this Report

## Douglas Partners



### Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

### Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

### Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

### Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

### Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

July 2010

## *About this Report*

### **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

### **Information for Contractual Purposes**

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

### **Site Inspection**

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

July 2010



**Investment Summary Report  
August 2018**

**Camden Council**  
Executive Summary - August 2018



**Investment Holdings**

	Amount (\$)	Current Yield (%)
Cash	5,500,000.00	1.60
Term Deposit	123,200,000.00	3.07
	<b>128,700,000.00</b>	

**Detailed Maturity Profile**

	Amount (\$)	Current Yield (%)
00. Cash + Managed Funds	5,500,000	4%
01. Less Than 30 Days	11,000,000	9%
02. Between 30 Days and 60 Days	14,000,000	11%
03. Between 60 Days and 90 Days	13,000,000	10%
04. Between 90 Days and 180 Days	37,000,000	29%
05. Between 180 Days and 365 Days	18,700,000	15%
06. Between 365 Days and 3 Years	16,000,000	12%
07. Between 3 Years and 5 Years	13,500,000	10%
	<b>128,700,000</b>	

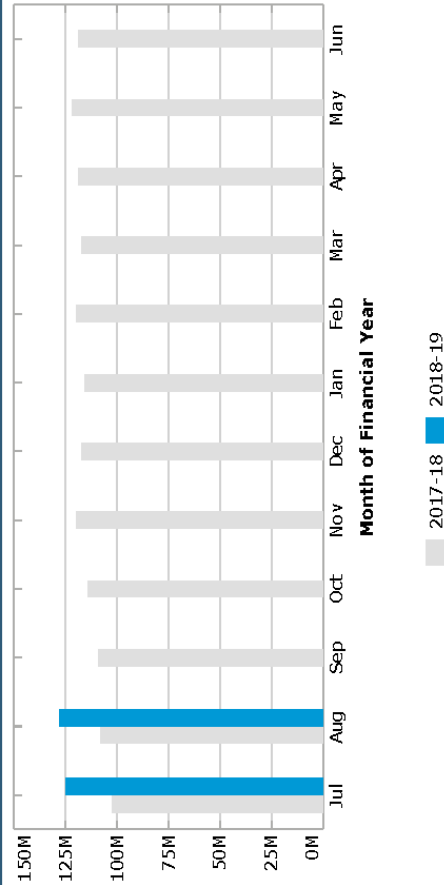
*Percentages in this report may not add up to 100% due to rounding*

**Sources of Funds**

	Amount (\$)
Section 7.11 Developer Contributions	66,000,000
Restricted Grant Income	1,400,000
Externally Restricted Reserves	13,400,000
Internally Restricted Reserves	26,000,000
Camden Regional Economic Taskforce	350,000
General Fund	21,550,000
<b>Total Funds Invested</b>	<b>128,700,000</b>

Council's investment portfolio has increased by \$4.0m since the July reporting period, the increase primarily relates to the first rates instalment for the 2018/19 financial year. The source of funds invested are indicative only, due to Council's annual financial reports still being finalised for 30 June 2018.

**Investment Portfolio Balance**



**Camden Council**

Individual Institutional Exposures Report - August 2018



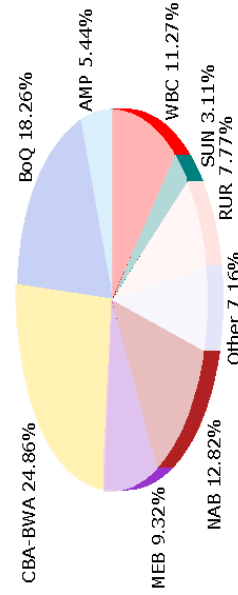
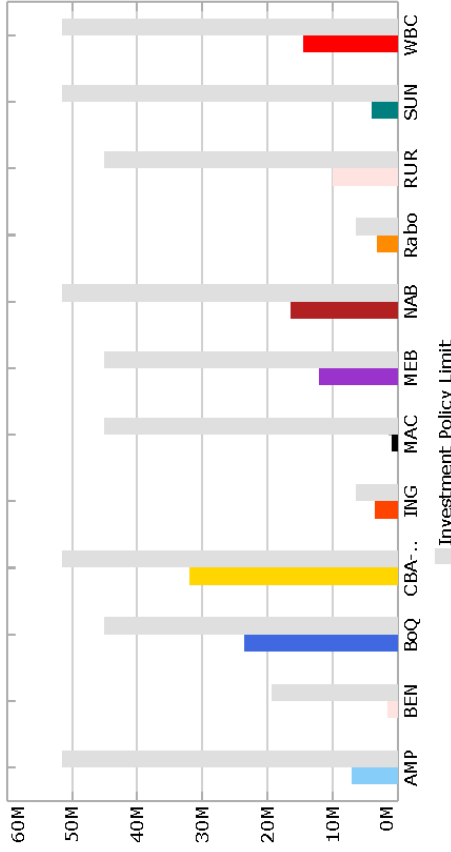
**Individual Institutional Exposures**

Parent Group	Exposure (\$M)	Credit Rating	Policy Limit	Actual	Capacity
AMP Bank	7.00M	A-1, A	40.00%	5.44%	44.48M
Bank of Queensland	23.50M	A-2, BBB+	35.00%	18.26%	21.55M
Bendigo and Adelaide Bank	1.50M	A-2, BBB+	15.00%	1.17%	17.80M
Commonwealth Bank of Australia	32.00M	A-1+, AA-	40.00%	24.86%	19.48M
ING Group (Foreign Sub)	3.50M	A-1*, A-*	5.00%	2.72%	2.94M
Macquarie Group	1.00M	A-1, A	35.00%	.78%	44.05M
Members Equity Bank	12.00M	A-2, BBB	35.00%	9.32%	33.05M
National Australia Bank	16.50M	A-1+, AA-	40.00%	12.82%	34.98M
Rabobank Aus (Foreign Sub)	3.20M	A-1*, A+*	5.00%	2.49%	3.23M
Rural Bank	10.00M	A-2, BBB+	35.00%	7.77%	35.05M
Suncorp Bank	4.00M	A-1, A+	40.00%	3.11%	47.48M
Westpac Group	14.50M	A-1+, AA-	40.00%	11.27%	36.98M
	<b>128.70M</b>				

\*Council's investment policy limits investments in foreign subsidiary banks which are monitored by APRA to a maximum 5% of the total portfolio in any single entity

Council's portfolio is within its individual institutional investment policy limits.  
 Council's portfolio is within its term to maturity investment policy limits.  
 Council's portfolio complies with the NSW Ministerial Investment Order.

**Individual Institutional Exposure Charts**



**Camden Council**

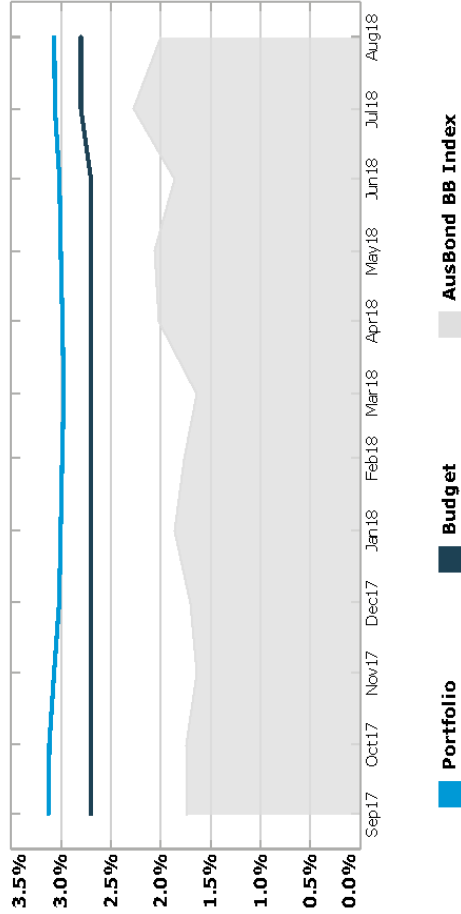
Performance Summary - August 2018



**Interest Summary**

Interest Summary as of August 2018	
Number of Investments	99
Average Days to Maturity	289
Weighted Portfolio Yield	3.07%
CBA Call Account	1.60%
Highest Rate	5.10%
Lowest Rate	2.40%
Budget Rate	2.80%
Average BBSW (30 Day)	1.87%
Average BBSW (90 Day)	1.96%
Average BBSW (180 Day)	2.15%
Official Cash Rate	1.50%
AusBond Bank Bill Index	1.99%

**Investment Performance**



**Interest Received During the 2018/2019 Financial Year**

	August	Cumulative	Original Budget	* Revised Budget
General Fund	\$145,533	\$267,460	\$1,450,000	\$1,450,000
Restricted	\$177,600	\$367,575	\$1,230,000	\$1,230,000
<b>Total</b>	<b>\$323,133</b>	<b>\$635,035</b>	<b>\$2,680,000</b>	<b>\$2,680,000</b>

\*The Revised Budget is reviewed on a quarterly basis as part of the Budget Process

**Historical Performance Summary**

	Portfolio	AusBond BB Index	Outperformance
Aug 2018	3.07%	1.99%	1.08%
Last 3 Months	3.05%	2.04%	1.01%
Last 6 Months	3.02%	1.97%	1.05%
Financial Year to Date	3.06%	2.13%	0.94%
Last 12 months	3.04%	1.85%	1.18%

**Investment Performance**

Council's portfolio returned 3.07%pa on a weighted average yield basis during August. This compares favourably with the Ausbond Bank Bill Index's return of 1.99%pa for the month.



## Camden Council

Investment Holdings Report - August 2018



<b>Cash Accounts</b>						
Amount (\$)	Current Yield	Institution	Credit Rating	Amount (\$)	Deal No.	Reference
5,500,000.00	1.60%	Commonwealth Bank of Australia	A-1+	5,500,000.00	535548	
<b>5,500,000.00</b>				<b>5,500,000.00</b>		

<b>Term Deposits</b>										
Maturity Date	Amount (\$)	Rate	Institution	Credit Rating	Purchase Date	Amount plus Accrued Int (\$)	Deal No.	Accrued Interest (\$)	Coupon Frequency	Reference
3-Sep-18	1,500,000.00	2.56%	National Australia Bank	A-1+	3-Apr-18	1,515,886.03	536482	15,886.03	At Maturity	3081
5-Sep-18	1,000,000.00	2.40%	AMP Bank	A-1	9-Apr-18	1,009,534.25	536524	9,534.25	At Maturity	3082
10-Sep-18	1,000,000.00	2.65%	National Australia Bank	A-1+	10-Apr-18	1,010,454.79	536525	10,454.79	At Maturity	3083
12-Sep-18	1,500,000.00	2.70%	Bankwest	A-1+	11-Apr-18	1,515,867.12	536531	15,867.12	At Maturity	3084
17-Sep-18	1,500,000.00	2.70%	Bankwest	A-1+	12-Apr-18	1,515,756.16	536534	15,756.16	At Maturity	3085
19-Sep-18	1,500,000.00	2.60%	National Australia Bank	A-1+	22-Mar-18	1,517,416.44	536460	17,416.44	At Maturity	3079
24-Sep-18	1,000,000.00	2.70%	Bankwest	A-1+	16-Apr-18	1,010,208.22	536536	10,208.22	At Maturity	3086
24-Sep-18	500,000.00	2.70%	Bankwest	A-1+	27-Apr-18	504,697.26	536551	4,697.26	At Maturity	3088
26-Sep-18	1,000,000.00	2.70%	Bankwest	A-1+	23-Apr-18	1,009,690.41	536544	9,690.41	At Maturity	3087
26-Sep-18	500,000.00	2.70%	Bankwest	A-1+	27-Apr-18	504,697.26	536552	4,697.26	At Maturity	3089
2-Oct-18	1,500,000.00	2.75%	Suncorp Bank	A-1	30-Apr-18	1,514,013.70	536557	14,013.70	At Maturity	3090
3-Oct-18	1,500,000.00	2.66%	National Australia Bank	A-1+	2-May-18	1,513,336.44	536569	13,336.44	At Maturity	3091
8-Oct-18	1,000,000.00	2.70%	Bankwest	A-1+	2-May-18	1,009,024.66	536570	9,024.66	At Maturity	3092
8-Oct-18	500,000.00	2.70%	Commonwealth Bank of Australia	A-1+	8-May-18	504,290.41	536626	4,290.41	At Maturity	3093
10-Oct-18	1,000,000.00	2.67%	Bank of Queensland	A-2	9-May-18	1,008,412.33	536627	8,412.33	At Maturity	3094
15-Oct-18	500,000.00	2.67%	Bank of Queensland	A-2	14-May-18	504,023.29	536632	4,023.29	At Maturity	3096
15-Oct-18	1,000,000.00	2.67%	Bank of Queensland	A-2	16-May-18	1,007,900.27	536639	7,900.27	At Maturity	3097
17-Oct-18	1,500,000.00	2.67%	Bank of Queensland	A-2	21-May-18	1,511,301.78	536649	11,301.78	At Maturity	3098
22-Oct-18	1,000,000.00	2.64%	National Australia Bank	A-1+	23-May-18	1,007,305.21	536656	7,305.21	At Maturity	3099
22-Oct-18	500,000.00	2.65%	National Australia Bank	A-1+	4-Jun-18	503,230.82	536696	3,230.82	At Maturity	3105



## Camden Council Investment Holdings Report - August 2018

Term Deposits										
Maturity Date	Amount (\$)	Rate	Institution	Credit Rating	Purchase Date	Amount plus Accrued Int (\$)	Deal No.	Accrued Interest (\$)	Coupon Frequency	Reference
24-Oct-18	1,500,000.00	2.54%	Commonwealth Bank of Australia	A-1+	26-Feb-18	1,519,519.73	536310	19,519.73	At Maturity	3071
24-Oct-18	1,000,000.00	2.65%	AMP Bank	A-1	25-May-18	1,007,187.67	536663	7,187.67	At Maturity	3100
29-Oct-18	1,500,000.00	2.72%	Rural Bank	A-2	28-May-18	1,510,730.96	536664	10,730.96	At Maturity	3101
1-Nov-18	2,500,000.00	5.00%	Bank of Queensland	A-2	4-Nov-13	2,602,397.26	535476	102,397.26	Annually	2653
5-Nov-18	1,500,000.00	2.76%	Rural Bank	A-2	30-May-18	1,510,661.92	536670	10,661.92	At Maturity	3102
7-Nov-18	1,000,000.00	2.80%	Rural Bank	A-2	10-May-18	1,008,745.21	536628	8,745.21	At Maturity	3094
12-Nov-18	1,000,000.00	2.73%	Bank of Queensland	A-2	1-Jun-18	1,006,881.10	536689	6,881.10	At Maturity	3104
12-Nov-18	500,000.00	2.75%	Rural Bank	A-2	5-Jun-18	503,315.07	536705	3,315.07	At Maturity	3106
14-Nov-18	1,000,000.00	2.60%	Bank of Queensland	A-2	16-Feb-18	1,014,032.88	536241	14,032.88	At Maturity	3068
19-Nov-18	500,000.00	2.75%	Rural Bank	A-2	5-Jun-18	503,315.07	536706	3,315.07	At Maturity	3107
21-Nov-18	1,000,000.00	2.60%	Bank of Queensland	A-2	22-Feb-18	1,013,605.48	536261	13,605.48	At Maturity	3070
22-Nov-18	1,000,000.00	5.10%	Bank of Queensland	A-2	25-Nov-13	1,038,843.84	535477	38,843.84	Annually	2661
26-Nov-18	1,500,000.00	2.75%	National Australia Bank	A-1+	12-Jun-18	1,509,154.11	536740	9,154.11	At Maturity	3108
28-Nov-18	1,500,000.00	2.80%	Suncorp Bank	A-1	13-Jun-18	1,509,205.48	536743	9,205.48	At Maturity	3109
3-Dec-18	1,000,000.00	2.80%	Suncorp Bank	A-1	18-Jun-18	1,005,753.42	536754	5,753.42	At Maturity	3110
5-Dec-18	1,000,000.00	2.80%	National Australia Bank	A-1+	25-Jun-18	1,005,216.44	536785	5,216.44	At Maturity	3113
10-Dec-18	2,000,000.00	2.80%	National Australia Bank	A-1+	27-Jun-18	2,010,126.03	536801	10,126.03	At Maturity	3114
12-Dec-18	1,500,000.00	2.60%	Bank of Queensland	A-2	13-Dec-17	1,527,994.52	536086	27,994.52	At Maturity	3047
12-Dec-18	1,000,000.00	2.80%	National Australia Bank	A-1+	2-Jul-18	1,004,679.45	536807	4,679.45	At Maturity	3115
12-Dec-18	1,000,000.00	2.80%	Bankwest	A-1+	2-Jul-18	1,004,679.45	536808	4,679.45	At Maturity	3116
17-Dec-18	3,000,000.00	2.80%	Bankwest	A-1+	2-Jul-18	3,014,038.36	536810	14,038.36	At Maturity	3117
17-Dec-18	1,000,000.00	2.79%	National Australia Bank	A-1+	4-Jul-18	1,004,509.86	536825	4,509.86	At Maturity	3118
20-Dec-18	1,000,000.00	2.60%	Commonwealth Bank of Australia	A-1+	28-Feb-18	1,013,178.08	536317	13,178.08	At Maturity	3073
2-Jan-19	2,000,000.00	2.62%	Commonwealth Bank of Australia	A-1+	3-Jan-18	2,034,598.36	536117	34,598.36	At Maturity	3053
2-Jan-19	1,000,000.00	2.60%	Commonwealth Bank of Australia	A-1+	7-Mar-18	1,012,679.45	536366	12,679.45	At Maturity	3076
9-Jan-19	1,500,000.00	2.65%	Rural Bank	A-2	9-Jan-18	1,525,592.47	536128	25,592.47	At Maturity	3055

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## Camden Council

## Investment Holdings Report - August 2018



Term Deposits										
Maturity Date	Amount (\$)	Rate	Institution	Credit Rating	Purchase Date	Amount plus Accrued Int (\$)	Deal No.	Accrued Interest (\$)	Coupon Frequency	Reference
10-Jan-19	1,500,000.00	2.80%	National Australia Bank	A-1+	9-Jul-18	1,506,213.70	536832	6,213.70	At Maturity	3119
14-Jan-19	1,500,000.00	2.80%	Bankwest	A-1+	11-Jul-18	1,505,983.56	536839	5,983.56	At Maturity	3120
16-Jan-19	1,500,000.00	2.85%	ME Bank	A-2	13-Jul-18	1,505,856.16	536844	5,856.16	At Maturity	3121
21-Jan-19	2,000,000.00	2.85%	AMP Bank	A-1	21-Jun-18	2,011,243.84	536764	11,243.84	At Maturity	3111
23-Jan-19	1,000,000.00	2.85%	AMP Bank	A-1	25-Jun-18	1,005,309.59	536784	5,309.59	At Maturity	3112
29-Jan-19	1,500,000.00	2.85%	ME Bank	A-2	16-Jul-18	1,505,504.79	536850	5,504.79	At Maturity	3122
30-Jan-19	1,000,000.00	2.60%	Commonwealth Bank of Australia	A-1+	5-Mar-18	1,012,821.92	536346	12,821.92	At Maturity	3075
4-Feb-19	1,500,000.00	2.85%	ME Bank	A-2	23-Jul-18	1,504,684.93	536863	4,684.93	At Maturity	3123
6-Feb-19	2,000,000.00	2.85%	ME Bank	A-2	24-Jul-18	2,006,090.41	536865	6,090.41	At Maturity	3124
11-Feb-19	1,500,000.00	2.85%	ME Bank	A-2	26-Jul-18	1,504,333.56	536876	4,333.56	At Maturity	3125
13-Feb-19	1,500,000.00	2.85%	ME Bank	A-2	27-Jul-18	1,504,216.44	536878	4,216.44	At Maturity	3126
18-Feb-19	1,000,000.00	2.75%	Bank of Queensland	A-2	1-Aug-18	1,002,335.62	536908	2,335.62	At Maturity	3128
20-Feb-19	1,500,000.00	2.76%	Bankwest	A-1+	8-Aug-18	1,502,722.19	536927	2,722.19	At Maturity	3129
26-Feb-19	1,000,000.00	2.80%	AMP Bank	A-1	30-Jul-18	1,002,531.51	536884	2,531.51	At Maturity	3127
28-Feb-19	1,000,000.00	5.00%	RaboDirect	A-1*	28-Feb-14	1,025,342.47	535516	25,342.47	Annually	2702
6-Mar-19	1,200,000.00	5.00%	RaboDirect	A-1*	3-Mar-14	1,229,589.04	535517	29,589.04	Annually	2703
6-Mar-19	1,000,000.00	2.80%	ME Bank	A-2	8-Aug-18	1,001,841.10	536928	1,841.10	At Maturity	3130
12-Mar-19	1,500,000.00	2.80%	ME Bank	A-2	8-Aug-18	1,502,761.64	536929	2,761.64	At Maturity	3131
13-Mar-19	1,500,000.00	2.80%	Bankwest	A-1+	13-Aug-18	1,502,186.30	536948	2,186.30	At Maturity	3132
18-Mar-19	1,000,000.00	2.77%	Bankwest	A-1+	15-Aug-18	1,001,290.14	536963	1,290.14	At Maturity	3133
20-Mar-19	1,500,000.00	2.77%	Bankwest	A-1+	20-Aug-18	1,501,366.03	536982	1,366.03	At Maturity	3134
25-Mar-19	1,500,000.00	2.75%	Bank of Queensland	A-2	27-Aug-18	1,500,565.07	537011	565.07	At Maturity	3135
27-Mar-19	1,500,000.00	2.75%	Bank of Queensland	A-2	29-Aug-18	1,500,339.04	537023	339.04	At Maturity	3137
1-Apr-19	1,500,000.00	2.75%	Bank of Queensland	A-2	29-Aug-18	1,500,339.04	537024	339.04	At Maturity	3138
3-Apr-19	1,000,000.00	2.80%	AMP Bank	A-1	31-Aug-18	1,000,076.71	537046	76.71	At Maturity	3139
15-May-19	1,500,000.00	4.55%	Westpac Group	A-1+	15-May-14	1,520,381.51	535497	20,381.51	Annually	2717



## Camden Council Investment Holdings Report - August 2018

Term Deposits										
Maturity Date	Amount (\$)	Rate	Institution	Credit Rating	Purchase Date	Amount plus Accrued Int (\$)	Deal No.	Accrued Interest (\$)	Coupon Frequency	Reference
20-May-19	1,500,000.00	2.75%	Bankwest	A-1+	28-Aug-18	1,500,452.05	537016	452.05	At Maturity	3136
22-May-19	1,500,000.00	4.55%	Westpac Group	A-1+	21-May-14	1,519,259.59	535536	19,259.59	Annually	2718
25-Nov-19	1,000,000.00	2.90%	ING Bank (Australia)	A*	23-Nov-17	1,022,405.48	535985	22,405.48	Annually	3032
27-Nov-19	1,000,000.00	4.10%	Rabodirect	A*	27-Nov-14	1,031,227.40	535518	31,227.40	Annually	2760
27-Nov-19	2,000,000.00	2.88%	Rural Bank	BBB+	23-Nov-17	2,044,501.92	535987	44,501.92	Annually	3033
2-Dec-19	1,500,000.00	2.90%	ING Bank (Australia)	A*	27-Nov-17	1,533,131.51	535996	33,131.51	Annually	3035
2-Dec-19	1,500,000.00	2.83%	Rural Bank	BBB+	1-Dec-17	1,531,866.58	536020	31,866.58	Annually	3037
4-Dec-19	1,500,000.00	4.25%	Bendigo and Adelaide Bank	BBB+	28-Nov-14	1,548,380.14	535488	48,380.14	Annually	2762
11-Dec-19	1,500,000.00	4.00%	National Australia Bank	AA-	16-Dec-14	1,542,246.58	535504	42,246.58	Annually	2766
19-Dec-19	1,000,000.00	3.85%	Macquarie Bank	A	19-Dec-14	1,142,608.22	535503	142,608.22	At Maturity	2767
2-Feb-20	1,000,000.00	3.90%	Westpac Group	AA-	2-Feb-15	1,022,545.21	535537	22,545.21	Annually	2772
10-Feb-20	1,000,000.00	2.90%	ING Bank (Australia)	A*	8-Feb-18	1,016,287.67	536215	16,287.67	Annually	3065
15-Mar-21	1,000,000.00	3.60%	Bank of Queensland	BBB+	15-Mar-17	1,016,767.12	535484	16,767.12	Annually	2958
7-Apr-21	1,000,000.00	3.50%	Bank of Queensland	BBB+	3-Apr-17	1,014,479.45	535486	14,479.45	Annually	2963
17-May-21	1,000,000.00	3.10%	Westpac Group	AA-	16-May-17	1,001,358.90	535544	1,358.90	Quarterly	2975
1-Feb-22	1,000,000.00	3.60%	Westpac Group	AA-	1-Feb-17	1,003,057.53	535538	3,057.53	Quarterly	2936
2-Feb-22	1,500,000.00	3.57%	Westpac Group	AA-	2-Feb-17	1,504,401.37	535539	4,401.37	Quarterly	2937
10-Feb-22	1,000,000.00	3.56%	Westpac Group	AA-	10-Feb-17	1,002,145.75	535540	2,145.75	Quarterly	2938
15-Feb-22	1,500,000.00	3.75%	Bank of Queensland	BBB+	15-Feb-17	1,530,513.70	535547	30,513.70	Annually	2939
22-Feb-22	2,000,000.00	3.64%	Westpac Group	AA-	22-Feb-17	2,001,994.52	535541	1,994.52	Quarterly	2940
28-Feb-22	1,000,000.00	3.75%	Bank of Queensland	BBB+	27-Feb-17	1,019,109.59	535483	19,109.59	Annually	2946
28-Feb-22	1,000,000.00	3.55%	Westpac Group	AA-	28-Feb-17	1,000,389.04	535542	389.04	Quarterly	2950
1-Mar-22	1,000,000.00	3.58%	Westpac Group	AA-	1-Mar-17	1,009,023.56	535543	9,023.56	Quarterly	2952
3-Mar-22	1,000,000.00	3.60%	Westpac Group	AA-	3-Mar-17	1,008,778.08	535545	8,778.08	Quarterly	2954
9-Mar-22	1,000,000.00	3.61%	Westpac Group	AA-	9-Mar-17	1,008,011.23	535546	8,011.23	Quarterly	2956
23-Mar-22	500,000.00	3.80%	Bank of Queensland	BBB+	23-Mar-17	508,432.88	535485	8,432.88	Annually	2960

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**Camden Council**

Investment Holdings Report - August 2018



**Term Deposits**

Maturity Date	Amount (\$)	Rate	Institution	Credit Rating	Purchase Date	Amount plus Accrued Int (\$)	Deal No.	Accrued Interest (\$)	Coupon Frequency	Reference
4-May-22	1,000,000.00	3.60%	Bank of Queensland	BBB+	8-May-17	1,011,441.10	535487	11,441.10	Annually	2971
	<b>123,200,000.00</b>					<b>124,578,431.00</b>		<b>1,378,431.00</b>		



# Camden Council Minutes

**Business Assurance and Risk Committee  
Meeting**  
**28 June 2018**

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**Executive Boardroom  
Camden Council  
Administration Building  
70 Central Avenue  
Oran Park  
5.30PM**



## **BUSINESS ASSURANCE AND RISK COMMITTEE**

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**Voting Members present:**

Bruce Hanrahan	Independent Member (Chair)
Elizabeth Gavey	Independent Member
Cr Peter Sidgreaves	Camden Council Councillor

**Attendees:**

General Manager  
Internal Audit Coordinator  
Risk Management Officer  
Senior Governance Officer

**Invitees:**

Acting Director Community Assets  
Director Planning and Environment  
Director Sport, Community and Recreation  
Manager Governance and Risk  
Manager Corporate Performance and Customer Service (left at 5:36pm)  
Senior Financial Accountant (for Chief Financial Officer)  
Business Assurance Support Officer  
Caroline Karakatsanis Audit Office of NSW (External Auditor)

**Apologies:**

John Gordon	Independent Member (Chair)
Cr Theresa Fedeli	Camden Council Councillor
Marc Upcroft	PricewaterhouseCoopers (External Auditor)
Director Customer and Corporate Strategy	
Chief Financial Officer	

The Committee members approved that Mr Hanrahan would Chair the Committee meeting prior to commencement of the meeting as a result of the appointed Chair, Mr Gordon, being unable to attend.

**BUS01 Apologies****RECOMMENDED**

That leave of absence be granted to Councillor Fedeli and Mr Gordon from the Business Assurance and Risk Committee meeting.

**DECISION**

That Councillor Fedeli and Mr Gordon be granted leave of absence.

**BUS02 Declaration Of Interest****RECOMMENDED**

That any Business Assurance and Risk Committee declarations be noted.

**DECISION**

There are no Business Assurance and Risk Committee declarations to be noted.



**BUS03 Minutes To The 1 March 2018 Business Assurance And Risk Committee Meeting**RECOMMENDED

That the Business Assurance and Risk Committee:

- i. approve the minutes to the 1 March 2018 Business Assurance and Risk Committee meeting;
- ii. note the status of actions included in the actions list.

DISCUSSION

The Internal Audit Coordinator updated the Committee on the outstanding actions advising that the discussion paper from the Office of Local Government on the Internal Audit Framework has still not been issued but is progressing. It was advised that the Committee Charter would be reviewed regardless of the discussion paper being finalised. The remaining outstanding action items will be presented to a future meeting.

DECISION

The Business Assurance and Risk Committee:

- i. approve the minutes to the 1 March 2018 Business Assurance and Risk Committee meeting; and
- ii. note the status of actions included in the actions list.

**BUS04 Project Management Status Update**RECOMMENDED

That the Business Assurance and Risk Committee note the Project Management status update.

DISCUSSION

The Internal Audit Coordinator advised the Committee that the report provided an update on both the interim measures put in place and the longer term approach as requested at the 1 March 2018 Committee meeting. It was advised that target dates for implementation had now been assigned to each project management audit recommendation and significant progress had been made.

Ms Gavey commended the team for the commitment made to date and requested a status update on the progress of tasks to be completed by June 2018. The General Manager advised the relevant Charter had been adopted and resourcing was to be discussed at the next ELG meeting. Council is on track with all recommendations to date.

DECISION

The Business Assurance and Risk Committee note the Project Management status update.

Manager Corporate Performance and Customer Service left at 5:36pm.

#### **BUS05 Enterprise Risk Management Update**

##### RECOMMENDED

That the Business Assurance and Risk Committee note the status update on the establishment of Council's Enterprise Risk Management Framework.

##### DISCUSSION

The Risk Management Officer advised that the top ten risks have been included in the report and that the roll out of further training is now occurring.

Ms Gavey advised cyber risk is a common industry risk that would be expected to be a high risk for Council.

The Internal Audit Coordinator advised she was assisting with the training and that it was expected the registers may change in response to that training.

Clr Sidgreaves asked if the top 10 risks have been benchmarked against other Councils. Risk Management Officer and Internal Audit Coordinator confirmed that they have not been but it may be a good idea to check the common industry risks with other Councils once the current training and updating of the registers is complete.

##### DECISION

The Business Assurance and Risk Committee note the status update on the establishment of Council's Enterprise Risk Management Framework.

#### **BUS06 External Audit - Client Service Plan For Year Ended 30 June 2018**

##### RECOMMENDED

That the Business Assurance and Risk Committee:

- i. note the Camden Council Client Service Plan (CSP) for the year ended 30 June 2018
- ii. note the Report on Local Government 2017.

##### DISCUSSION

Ms Karakatsanis outlined the CSP and the relevant areas that will be looked at for Camden's audit.

Ms Gavey requested an update on the interim audit. Ms Karakatsanis advised there are no significant issues to note to date, however, the interim work is not yet finalised.

Mr Hanrahan noted that the Audit Office is taking over the audit of Camden Council from PricewaterhouseCoopers (PwC) next year.

Ms Karakatsanis discussed the Report on Local Government 2017 that was reported to Parliament in April and praised Camden for meeting its statutory obligations.

The Internal Audit Coordinator advised that Mr Gordon had requested that an action be included to undertake a gap analysis against the Report on Local Government 2017.

A You tube video was played following this paper to provide a high level overview of the inclusions in the report.

#### DECISION

The Business Assurance and Risk Committee:

- i. note the Camden Council Client Service Plan for the year ended 30 June 2018
- ii. note the Report on Local Government 2017.
- iii. requested a gap analysis be conducted between the issues raised in the Report on Local Government 2017 and Camden Council's current performance.

#### **BUS07 Footpaths Inspections And Maintenance Review Audit Report**

##### RECOMMENDED

That the Business Assurance and Risk Committee note the Footpaths Inspections and Maintenance Review audit report.

#### DISCUSSION

The Internal Audit Coordinator provided an overview of the footpaths inspections and maintenance review undertaken and its findings. It was advised that the report was aimed at improving the long term approach to the inspection and maintenance of footpaths. Work being undertaken to address current risks was also discussed.

Ms Gavey praised the current actions and asked if the findings could be equally applied to other asset categories. The Acting Director Community Assets advised that Council will be looking at the overall inspection process for all asset categories.

Ms Gavey asked about the process for the inspection of trees. The Director Sport, Community and Recreation provided an outline of the current process for trees.

#### DECISION

The Business Assurance and Risk Committee note the Footpaths Inspections and Maintenance Review audit report.

#### **BUS08 Section 355 Management Committees Internal Audit Report**

##### RECOMMENDED

That the Business Assurance and Risk Committee note the Section 355 Management Committees Internal Audit Report.

#### DISCUSSION

The Internal Audit Coordinator outlined the high level findings associated with the report and the need to ensure appropriate governance frameworks are in place while recognising the capacity of volunteers.

### DECISION

The Business Assurance and Risk Committee note the Section 355 Management Committees Internal Audit Report.

### **BUS09    Audit Report Recommendations - Implementation Status Update - May 2018**

### RECOMMENDED

That the Business Assurance and Risk Committee note the Implementation Status Update for May 2018.

### DISCUSSION

The Internal Audit Coordinator advised the improvement in outstanding recommendations completed since last reporting to the Committee. Ms Karakatsanis, Ms Gavey and Mr Hanrahan all provided positive feedback on the reporting and ease of reading.

Ms Gavey asked if completed recommendations are verified by audit. The Internal Audit Coordinator advised that although Council have not conducted a complete verification check, a reasonableness check of the response is undertaken prior to accepting recommendations as complete. Follow up audits will also be conducted over time.

### DECISION

The Business Assurance and Risk Committee note the Implementation Status Update for May 2018.

### **BUS10    Internal Audit Plan Status Update**

### RECOMMENDED

That the Business Assurance and Risk Committee note the Internal Audit Plan Status Update.

### DISCUSSION

The Internal Audit Coordinator discussed the status of VPA/WIKA audit, Fraud and Corruption Prevention Audit and the Gifts and Benefits Review and the audits about to commence.

A number of changes to the order of audits was also discussed and it was advised that an amended program of audits for the next 12 months would be brought to the next meeting.

Ms Gavey noted the extra work undertaken by the audit team on other activities and requested this be included in future updates to the Committee.

#### DECISION

The Business Assurance and Risk Committee:

- i. note the Internal Audit Plan Status Update.
- ii. requested time spent on other audit related activities be included in future internal audit plan status updates.

#### **BUS11 Work Health And Safety Update**

##### RECOMMENDED

That the Business Assurance and Risk Committee note the WHS Update.

#### DISCUSSION

The Internal Audit Coordinator discussed this report on behalf of the Chief People Officer. The General Manager discussed some of the good initiatives undertaken to ensure a safe workplace for all involved.

#### DECISION

The Business Assurance and Risk Committee note the WHS Update.

#### **BUS12 Checklist Of Compliance With Committee Requirements**

##### RECOMMENDED

That the Business Assurance and Risk Committee note the checklist of compliance with the Business Assurance and Risk Committee Charter and TPP 15-03.

#### DISCUSSION

The Internal Audit Coordinator advised this report was in response to an action item from the last meeting. The Committee were informed that the Charter and TPP15-03 requirements had been broadly met. More specific items have been added to the planned agendas for the next 12 months, where applicable, to ensure all requirements are addressed going forward.

Ms Gavey asked if general governance items can be included such as state government reports, Code of Conduct awareness and *Government Information and Public Access Act (GIPAA)* requests. The Internal Audit Coordinator advised that gap analyses on relevant state government reports are provided to the Committee as they arise. In addition the six monthly Governance report includes GIPAA requests and can include any other governance information as required. Reference to this Governance report will be included in the Checklist for future meetings.

Ms Karakatsanis advised that in state government, the results of staff surveys are often reported back to Committees.

### DECISION

The Business Assurance and Risk Committee note the checklist of compliance with the Business Assurance and Risk Committee Charter and TPP 15-03.

### **BUS13 General Business**

#### RECOMMENDED

That the Business Assurance and Risk Committee note any General Business items discussed.

### DISCUSSION

The Internal Audit Coordinator requested, on behalf of Mr Gordon, an update from the Manager Governance and Risk on the data breaches requirements discussed at previous meetings. In addition it was advised that another Council has a Data Breaches policy and that Management should consider if that is appropriate for Camden Council.

The Manager Governance and Risk advised Council requested a copy of the other Council's Data Breaches Plan and it was received just prior to tonight's meeting. This will be reviewed and considered in due course.

The Manager Governance and Risk also advised the Bill in relation to data breaches had now lapsed so there was no further progress. As it stands, the data breaches legislation applies to Tax File Numbers only. The Manager Governance and Risk advised they are consulting with the sector and our People and Learning branch to ensure requirements are met.

### DECISION

The Business Assurance and Risk Committee note the General Business items discussed.

### **Next Meeting:**

The next meeting of the Business Assurance and Risk Committee will be held on 30 AUGUST 2018 at Oran Park Administration Building Executive Boardroom, commencing at 5:30pm.

### **Future Meetings:**

Wednesday 10<sup>th</sup> October 2018

Thursday 13<sup>th</sup> December 2018

The meeting closed at 6.30pm.